This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

**Usage guidelines**

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

**About Google Book Search**

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

GODFREY LOWELL CABOT SCIENCE LIBRARY
*of the Harvard College Library*

This book is
FRAGILE
and circulates only with permission.
Please handle with care
and consult a staff member
before photocopying.

Thanks for your help in preserving
Harvard's library collections.

En

# Ninth ANNUAL REPORT

OF THE

# Croton Aqueduct Department;

MADE

TO THE COMMON COUNCIL

OF THE

(CITY) OF NEW YORK,
January 5th, 1858.

For 1857.

**Board of Aldermen,**

**January 5th, 1858.**

c
NEW YORK:
CHAS. W. BAKER, PRINTER, 29 BEEKMAN STREET.
1858.

~~Eng 19.856~~
Eng 1070.29

1870, Dec. 20.
Gift of
Geo. Augustus Cushing,
of New York.

# Croton Aqueduct Department,

ORGANIZED

UNDER A LAW OF THE LEGISLATURE

Of the State of New York,

PASSED

April 11, 1849.

## Croton Aqueduct Board.

PRESIDENT COMMISSIONER,

**MYNDERT VAN SCHAICK,**

COMMISSIONER,

**THEODORE R. DE FOREST,**

ENGINEER,

**ALFRED W. CRAVEN.**

### Bureau of Pipes, Sewers and Pavements.

**JOHN P. FLENDER, Chief, and Water Purveyor.**

### Bureau of Water Rents.

**REVO C. HANCE, Registrar.**

**WILLIAM FARDON, Deputy Registrar.**

## DOCUMENT No. 2.

# BOARD OF ALDERMEN,

## JANUARY 5, 1858.

The Annual Report of the Croton Aqueduct Department, was received, laid on the table, and ordered to be printed.

D. T. VALENTINE, *Clerk.*

CROTON AQUEDUCT DEPARTMENT,
December 31, 1857.

*To the Honorable the Common Council*
*of the city of New York:*

In obedience to law, the Croton Aqueduct Board beg leave to present the Annual Report for the current year, showing, in as succinct form as possible, under their appropriate heads, the expenditures for the year, and the objects of labor which have occupied the attention and time of the Board and its officers.

## Aqueduct Repairs and Improvements.

The most important work paid for under this head, is that which is necessary along the whole line of the work, from the dam to the distributing reservoir. A most minute inspection and watchfulness has always been, and is daily kept up, by the superintendents along the entire line of the work, in order to detect and check, in its incipiency, any action of time or other imperfection which might endanger the safety of the work, and to guard against any encroachments on the city property connected therewith This care and this work is the duty of superintendents, whose ability, fidelity and prudence have been tested by experience varying from nine to seventeen years, and the result has been such as to fully entitle them to the greatest confidence.

The opposition, which has heretofore existed, to the erection of fences on the line of the aqueduct, to prevent encroachments or damage, still continues; but, through the conciliatory measures and firm assertion of the rights of the Corporation, constantly shown by the Board, it seems to be, in some degree, abated in violence. The quantity of fencing put up during the year is six thousand two hundred and fifty-seven lineal feet in length.

The examination of the interior of the conduit was made in the early part of the month of December. The water was shut off at Croton lake on the 2d December, and on the 3d the Chief Engineer entered the aqueduct at the dam, and, accompanied by his usual attendants, the Assistant Engineer and the superintendents of the divisions, respectively, made a careful and complete inspection of the interior of the aqueduct through its entire length, coming out of the conduit, at the Receiving Reservoir, in this city, on Saturday, the 6th December. The gates at Croton lake were re-opened on the 6th, at noon, and the water reached the Receiving Reservoir on Sunday, the 7th, at 9·30 A. M.—having been shut off from the city ninety-four hours, being twenty hours longer than that taken during the past few years.

The cracks in the masonry on the embankments still continue, though yearly diminishing in size and importance; but, however slight they may be, it is the part of prudence to check their progress as soon as they are discovered. The state of the aqueduct, as shown in the examination this year, like those of the years preceding, is evidence of the durable character of this great work, and of the extreme care with which it was constructed. As soon as the new reservoir shall be completed, the large storage of water in the city will enable the Board to make more thorough and extended repairs on the line. With our present city storage, it would be attended with great inconvenience and extreme danger, in case of fires, to keep the water shut off a longer time than that usually taken for our annual repairs; but it is to be hoped that the speedy completion of the new grand reservoir will relieve us of this difficulty, by enabling us to take longer time for our work, and still supply the city with water during its progress.

The original houses for the superintendents were of the most cheap and frail description—the constant expense necessary to keep them in a tenantable condition, has forced upon the Board the conviction, that true economy required the construction of new houses, of such materials and character as to insure entire permanency. These cottages have this year been completed throughout the lines. The one at the dam is a substantial stone building—in its style it is designed to be an ornament to the grounds about the dam, and in its size it is meant, not only to provide apartments for the superintendent of the dam and first division, but to furnish necessary accommodations for the engineers, whose duties frequently oblige them to be at that portion of the line, and also to accommodate the inspecting committees of the Common Council, and other members of the city government, whose taste may induce them to visit the Croton dam and lake—those magnificent works of nature and art, which contribute so essentially to the comfort, health and prosperity of this great city.

The other cottages, six in number, are plain and substantial buildings, intended solely for the use of the several superintendents.

The total cost of the supervision and the repairs of the aqueduct, both for the surface and the interior, together with the cost of fencing, and the construction of the cottages referred to, has been forty-four thousand six hundred and twenty dollars and seventy-two cents. The details may be found in schedule No. 7, in the appendix.

## Croton Water Works Extension.

The chief work under this head, which has engaged the attention of the Board, during this year, is the new grand reservoir. The land for its site was acquired during the year 1856, as shown in our report of that year. The ground thus taken was rectangular in form, and was bounded by Eighty-sixth and Ninety-sixth streets, and Fifth and Seventh avenues. Acting, however, under the authority of an act of the legislature, passed April 17, 1857, an exchange of property has been made between the Commissioners of the Central Park and this Board. By this exchange, an area, equal in extent to that originally acquired, was laid out in a shape conforming strictly to the existing contour of the ground—the line being run in such a manner as to take advantage of the aids to economy, and excellence of the work, which the natural shape and character of the ground presented. Much rock cutting, and heavy embankment, has been thereby avoided—a saving in cost of nearly two hundred thousand dollars secured, and the reservoir itself, by its shape and location, is made the chief ornament to the Park. When filled, this great storehouse will present the appearance of a beautiful lake and the Board suggest, that an appropriate name, by which it may be distinguished hereafter, would be "The Lake of Manahatta."

The maps of the land thus exchanged, signed by the Commissioners of the Central Park, and the members of this Board, are on file in the offices of the Comptroller, of the Central Park, and of this department respectively.

The ground taken for the reservoir comprises 106·75 acres in area. The water surface will be ninety-six acres in area; and the depth, when full, will be thirty-eight feet. Its total capacity will be 122,035,916 cubic feet, or 1,029,880,145 gallons, New York standard measure.

The scientific examinations and calculations necessarily preliminary to the exchange of land, and to the final preparation of the work for contract, have been, from their commencement, under the more immediate supervision of

George S. Greene, Esq., resident engineer of the work. The specifications have been drawn with extreme care, and in great detail, and, being fully carried out, the work produced cannot but prove perfectly substantial and durable, and adequate, in all respects, to the purposes required.

During the progress of the surveys, and other preparations for putting the main work of the reservoir under contract, a sewer was laid out and built, from near the proposed line of the reservoir in Eighty-sixth street, to the present waste sewer from the Receiving Reservoir, connecting with it at Eightieth street. It is four feet in diameter, and one thousand nine hundred feet long, and is intended as a conduit from the waste weir of the new reservoir, and as a means of drawing off the water therefrom, if required. Owing to circumstances, hereinafter explained, this is the only actual work yet done, toward the construction of the great work so much needed by our city.

All the calculations, plans and specifications for the reservoir being fully completed, the work was advertised for contract, and on the 26th August the proposals were opened according to law, in the presence of the Comptroller of the city, and the Board. As in all other cases where work is let by this Board, those proposals which were not in conformity with the requirements of the ordinance, were rejected as informal, and consequently not to be considered in the award of the contract. One of these informal proposals was put in over the name of Dinsmore, Wood & Co.

Before the Board had acted upon those proposals, which were adjudged to be in legal form, Messrs. Dinsmore, Wood & Co. commenced proceedings at law to enforce the consideration of their bid. The next lowest bidders, were Fairchild, Coleman, Walker and Brown, and next above them were John P. and Thomas Cumming.

At about the same time with the suit of Dinsmore, Wood & Co. the Messrs. Cumming instituted proceedings to compel the Board to award the contract to them on the ground that the proposal of Fairchild & Co., was also, by the terms of the law, informal. The claim of Dinsmore, Wood & Co., was adjudicated in the special term of the Supreme Court, and the action of this Board sustained. An appeal was taken to the general term, and since that period all three of the parties claiming, have been heard at the general term of that court, and the action of this Board again sustained. The papers connected with the award, will accordingly be sent to your Honorable Body for confirmation.

Had it not been for the restraint thus placed upon the Board, the construction of the new reservoir would at this time have been in an advanced stage of progress; promising the early completion of a work much required by the city, and giving daily employment to upward of a thousand men. The specification, and form of contract for the reservoir, and the proposals received, are placed, as a matter of reference, in the appendix to this report.

Under the head also, of Croton Aqueduct Extension, the Board have this year commmenced a hydrographic survey of the entire valley of that portion of the Croton river, which lies above the point at which we take its waters, namely, at Croton Dam. The object of this survey is to establish suitable points for storage reservoirs, in which to collect the surplus water in favorable seasons.

When the daily consumption of the city shall exceed the quantity afforded by the river, in seasons of drought, these storage reservoirs will be required to make up the deficit. It is the part of prudent foresight to acquire the sites for these contemplated reservoirs at an early day, even though the actual construction of them should be delayed until called for by necessity.

With this view, the surveys now in progress have been carefully prosecuted, and when completed, will show the entire "water shed" of the Croton river, and that of each of its main tributaries, as well as the character and shape of every locality developed by the examinations as being favorable for the construction of dams, and the preservation, in proper condition, of large bodies of water.

The party engaged on this important work is under the immediate charge of James H. Morley, as engineer. The party went into the field in July, and continued in camp until the 21st December, having made a thorough examination of about two thirds of the whole area to be surveyed.

The party will take the field again, early in the spring, and the entire work will probably be completed before the end of the summer.

The cost, thus far, has been four thousand five hundred and ninety dollars and seventy-four cents.

## Water Pipes and Laying.

The expenditures under this head, during the past year amount to ninety-one thousand two hundred and ninety-three dollars and twenty-seven cents.

The particulars of expenditures, and the new lines of pipe laid, may be found in schedules 9 and 17, respectively, of the appendix.

The quantity laid, since the introduction of the Croton water, together with the number of miles put down under the Board, as at present organized, may be found in schedule 18, which also gives the size of each kind now in service.

## Income from Water Rents.

The yearly receipts, notwithstanding the depression in the financial world, show a gratifying increase.

The amount received this year is six hundred and ninety-seven thousand three hundred and seventy dollars and fifty-one cents, being an increase over the largest yearly receipts yet known, of twenty-two thousand six hundred and thirty-four dollars and nine cents.

## St. Nicholas Hotel.

Reports having been made to this department in 1855, describing, in general terms, the enormous and extraordinary consumption of water by the St. Nicholas Hotel, five metres were in succession affixed to that immense establishment. After they had been in operation eight or nine weeks, the proprietors, or one of them, called at the office on several days, and complained that the operation of the metres limited their supply of water so as to give dissatisfaction to the boarders, on one of these occasions, a gentleman was named, who threatened to remove from the hotel unless he could get more water.

Finally, the Assistant Commissioner agreed with Mr. Treadwell, one of the proprietors, in October, 1855, that the metres should be taken off, and that the hotels should be charged by the year, at the same ratio of consumption as should be ascertained by the metres, while they were on the buildings. This verbal understanding and agreement was made in the presence and with the consent of the President. The metres were accordingly taken off on or about the 1st November, completing an even period of three months, for the purpose of facilitating the calculation for the year. When payment, according to the agreement, was demanded, the proprietors refused, claiming that they were not obliged to pay by the measurement of the metre, but by the number of rooms contained in their buildings, in the form and manner prescribed by the ordinance.

It is sufficient to say, in answer to that objection, that the same ordinance, passed March 20, 1851, "establishing a scale of water rents for the Croton Aqueduct Department," ordains that "all manufacturing and *other business, requiring a large supply of water*, are to be charged therefor per one hundred gallons, on the average estimated quantity during the year."

The metre is the best estimator or measurer that has ever been discovered.

Surely a hotel, consisting of several buildings, of the largest class, which consumes as much water in one year, as the whole population of the city, (some six or seven hundred thousand people,) consume in one day, including the quantity used by street washers, sprinklers, horses, ships, steamers, manufactories, &c., must come under the designation of "other business requiring a large supply of water."

This position is unassailable and conclusive. But, independent of this authority, the Board claims the right of charging for the water and of cutting off the supply for non-payment, on even higher grounds.

The act of the legislature, creating this department passed April 11, 1849, enacts—

"§ 27. The rules and restrictions, printed on each permit, shall be notice to the water-takers, and shall authorize the exaction and recovery, by process of law, of any penalties which the Croton Aqueduct Board may impose, in addition to the cutting off the use of the water, for any violation of the rules; and this section shall be printed on each permit."

"Rule 8. The Department reserves to itself the right to apply a metre to any such premises as they may deem advisable."

Both the 27th section of the statute, and the 8th rule of the Board, were printed on the permit given to the St. Nicholas. The 19th section of the statute confers, by plain inference, power on the Board as well as on the Common Council, to regulate the extra rates, and this power has always been exercised by the Board, in cases in which the legislative power of the city has not sufficiently provided a rule by its ordinances.

As discovered by the metres which were affixed to that series of buildings, the St. Nicholas was taking thirty-six millions one hundred and seventy-two thousand seven hundred and seventy-four gallons a year. Is not the authority which has been granted most ample to enable the Department to procure payment for an extravagant and enormous supply—and may we not, in such a case, cut off the water for the non-payment of thousands of dollars, when we cut it off for any delinquency in the payment of small sums. If the right to cut off the water for non-payment of the irregular or extra rates did not exist, what proportion of the rent would be collected? In a few years, the revenue from that source would disappear, to an alarming extent, at least—if not totally. The responsibility of preserving the supply of the water is imposed on the Commissioners by section 4 of the statute. Suppose there were ten or twenty such enormous establishments on the island—as there well may be, if the anticipations of the increase of its population and business are realized—how is the water to be preserved, if it is allowed to be used or wasted to the excess of more than thirty-six millions of gallons a year, and that without payment therefor.

By section 19 of the statute, the power to charge additional rents to hotels and other buildings and establishments which consume extra quantities of water, is sufficiently comprehensive to be exercised by the Common Council or the Croton Water Board. The whole subject is pregnant with interest, and sustained by the 27th section of the statute and 8th rule of the Board, the right of either the Corporation or the Croton Aqueduct Board to charge by metre cannot be considered doubtful—but, on the contrary, is rendered perfect and complete. There has been paid by the proprietors of the St. Nicholas Hotel, on the 19th day of December, 1856, two thousand six hundred and twenty-one dollars and fifty cents; and on the 7th day of November, 1857, one thousand dollars—leaving a very heavy balance of the account of the Registrar unpaid.

The question of the right of the Department to charge by metre is still not finally adjudicated and submitted to by the proprietors of the hotel—though, as far as the judgment of the court has been pronounced, it is in favor of the right of the Department to make the charge.

A full exhibition was given, in the last annual report, of the situation of the claim made by the Department in behalf of the Corporation, against the state, for six years' supply of Croton water furnished to the state prison at Sing Sing.

The demand was finally settled by a law of the State for the amount claimed at the annual rent contended for by the president; and on the 9th day of September, a check for eight thousand six hundred and twenty-seven dollars and fifty cents, including one thousand six hundred and twenty-seven dollars and fifty cents of interest on the principal sum, was received from the Comptroller of the State.

The terms for a further supply, commencing on the first day of May, 1857, have not been settled—the legislature not having agreed to that section of the bill which proposed to charge the State at the rate of three-quarters of a cent per one hundred gallons, As our own largest consumers are obliged by ordinance to pay one cent for every hundred gallons, the concession of one fourth part of that price was deemed to be sufficiently liberal to the State to insure its agreement, and to induce the legislature to make provision in the law for its annual payment. The subject remains in that situation; but efforts to have it definitely settled will be renewed during the coming session of the legislature.

## Waste of Water.

But very little can be added to the reports of former years on this subject. No restraint, in this regard, seems to be exercised by house-holders, and no efforts on the part of the Board seem to be of any avail in checking a degree of waste within the doors of private houses and stores, which is as unwarrantable and dishonest in itself, as it is unjust to the officers whose duties and cares it renders doubly harrassing. The waste, outside of buildings has been, in some degree, diminished by the prompt enforcement of penalties; but, within the houses, our inhabitants must be left almost to their own sense of right, and the Board have found that but little can be hoped for from the existence of such a principle.

## Sewers and Drains.

The number, size and locality of the sewers, basins and culverts constructed during the year, amounting in length to ten thousand four hundred and thirty feet, are shown in Schedule No. 16.

The expenditures for repairing and cleaning the entire sewerage of the city, now amounting to one hundred and forty miles, will be found in Schedule No. 10.

The amount for cleaning necessarily increases from year to year, as the area of sewerage is extended. As the sewers built by this department, however, do not require repairs, and in most cases much less cleansing than those heretofore constructed, this expense does not increase in full proportion with the extension of area drained.

Schedule 3, gives the weekly receipts for permits to make connections with sewers, amounting in all to the sum of twenty-one thousand four hundred and twenty-five dollars and fifty cents.

## Paving and Repairing Streets.

By the amended charter of 1857, the charge of paving the streets, and of repairing the pavements already existing, was transferred from the offices of the Street Commissioner and the Commissioner of Repairs and Supplies to this department, the change to take effect on the 1st May. Owing to many obstacles, the documents and property necessary for taking charge of the work, were not obtained by this Board until the 15th June. At this time it was found, that of the appropriation for the year, only thirty-six thousand five hundred and twenty-five dollars and sixty-six cents remained. With this small sum it was possible to repair only the worst places in the numerous streets which were found to be in a bad condition. In Schedule 19 there is furnished the particulars under this head. It exhibits the streets repaired, the number of days' work, and the amount of materials used.

The construction and repairs of pumps and wells were also transferred from the same offices to this department. No portion of the appropriation, however, remained unexpended, and they have been repaired, merely, so far as was actually necessary, to prevent accident. The money thus expended was, of necessity, advanced by the Comptroller from the Contingent Fund.

In conclusion, the Board have again the pleasure of presenting, as in former years, a report, showing a surplus of unexpended appropriation under each head of expenditure.

All of which is respectfully submitted,

MYNDERT VAN SCHAICK,
THEODORE R. DE FOREST,
ALFRED W. CRAVEN,
*Croton Aqueduct Board.*

## WATER CHRONOLOGY OF THE CITY OF NEW YORK.

As a matter of future reference, and to many of present interest, the Board have appended to this report a succinct account of every proceeding connected with the water supply of this city, beginning with the earliest steps toward that end, and coming down to the present date: prior to 1854, shis history is copied from the Manual of the Corporation.

The first item on record bears date

1774. When the Corporation, adopting the plan proposed by Christopher Colles, commenced the construction of a reservoir and other works, on the east line of Broadway, between Pearl and White streets, for the purpose of supplying the city with water; and for defraying the expense of the undertaking, issued a paper money, amounting to two thousand five hundred pounds, under the denomination of *Water Works Money*, and bonds were executed in favor of certain individuals for land and materials, to the amount of eight thousand eight hundred and fifty pounds more. The original issue of money was in bills of

| | | | |
|---|---|---|---|
| 4,000 | of the value of | sixpence, each.......... | £100 |
| 4,000 | " " | one shilling each..... | 200 |
| 4,000 | " " | two shillings each.... | 400 |
| 2,500 | " " | eight shillings each... | 1,000 |

August 2. An additional sum of twenty-six hundred pounds was ordered of the several denominations, following:

| | | | |
|---|---|---|---|
| 3,000 | of the value of | eight shillings each.. | £1,200 |
| 4,000 | " " | four shillings each.... | 800 |
| 5,000 | " " | two shillings each.... | 500 |
| 2,000 | " " | one shilling each..... | 100 |

1775. A spacious reservoir was erected, but in consequence of the war of the Revolution, and the occupation of the city by the British, the work was abandoned.

1785. In April, Samuel Ogden made proposals to the Corporation for erecting and establishing the water works to supply the city.

1786. In January, Hon. R. Livingston and John Lawrence presented proposals for a like object. The Corporation approved and ordered that proposals be received. The sense of the people was taken, and the opinion prevailed generally, " that the Corporation ought not to grant the privilege of supplying the city with water to individuals, but that the same ought, if possible, to be undertaken by the Corporation."

1788. The subject was again agitated, and in January the people petitioned that the plan of Mr. Colles be adopted, or any thing that the Corporation might deem more expedient.

1789. The Rumseian Society, of Philadelphia, notified the Board, that they would make proposals for a contract to supply the city, when the patent for Mr. Rumsey's engine was perfected. The Board passed a resolution inviting such proposals. Nothing further resulted from this proposition.

1792. In February, Zebrina Curtis and others, made proposals, which were referred to the Street Committee, and there died.

1795. In March, like proposals were made by Amos Porter, and a specific plan was submitted by Samuel Crane, to lead water from the Tea Water pump, through Roosevelt street. Another project was presented by Benjamin Taylor.

1796. In February, a Committee of the Common Council were directed to advertise for proposals, and in December, Joseph Brown and associates, made offers to supply the city by means of pipes.

1797. Sealed proposals for supplying the city, by means of pipes, were advertised for, and some seven or eight different applications were received; among them, one from Christopher Colles, who had undertaken the work in 1774. These were referred to a committee.

1798. R. J. Roosevelt and Judge Cooper, of Otsego, made new applications. To this time the water from the Collect, the Tea Water Pump, and wells dug for the purpose, had been the sources relied on. Dr. Joseph Brown, in a communication to the Common Council, recommended the Bronx river as a source from which to obtain a supply of good water for the use of the citizens. This is the first indication on record, that a supply from without the city was looked to. A Committee of the Common Council reported favorably, and recommended an investigation, and that an application be made to the legislature for an act to invest the Corporation with power to effect the great end they have in view, and granting them the moneys arising from the tax on sales at auction, or by loans founded thereon, to defray the expenses necessary to the undertaking.

1799. Mr. William Weston, a civil engineer, recommended by the Committee in the preceding report, was employed by the Common Council to examine and report on the practicability of introducing the Bronx river into the city; and in March he reported favorably, only however on information gained by walking over and viewing the ground. In April, of this year, the Manhattan Company was incorporated by an act of the legislature, the object of which was declared to be, to supply the city with pure and wholesome water, privileged by their charter to go over the whole island of New York, and into Westchester county to seek for good water. The company contented themselves with sinking a large well at the corner of Duane and Cross streets, and thence pumped up what *they* called pure and wholesome water.

1804. Under the mayoralty of De Witt Clinton, a committee was appointed to report upon the practicability of supplying the city with pure and wholesome water, and especially to confer with the Manhattan Company, as to the terms upon which they would cede to the Corporation their works and privileges of supplying water; but nothing seems to have come of it.

1816. A committee was appointed in March, to consider and report upon the propriety of making an application to the legislature, to invest the Mayor, Aldermen and Commonalty with all necessary powers to supply the city with water. The minutes contain no report from this committee.

1819. Robert Macomb presented a memorial for permission to supply the city with water, (collected at a reservoir at Harlem river,) for all domestic purposes. The scheme of Mr. Macomb and associates, was to bring the water from Rye pond, and they professed their ability to complete the work in two years, *without any aid or compensation from the Common Council*, asking only the privilege of laying down the pipes and selling the water. For the consideration of this subject, they asked the appointment of a committee, and one was appointed to confer with them. After repeated conferences with Mr. Macomb, and being satisfied that he and his associates had the requisite means to carry their project into effect, they, in the spring of

1820, reported in favor of the project, with some resolutions, which were agreed to. The minutes, however, show nothing further.

1821. Stephen Allen, Mayor. Another resolution of inquiry into the best means of supplying the city with water, was adopted, and a committee appointed to procure plans, estimates, &c., provided the expense should not exceed two hundred dollars.

1822. The Mayor again brought the subject before the Common Council, which was referred to a Committee, of which he was one; and, at a meeting in April, they made a report of their observations, and recommended the appointment of an engineer to survey and profile the whole line between the city and the main source of the river Bronx. The recommendation was concurred in, and Canvas White was employed to make the survey and estimate.

1823. A new scheme was started, that of bringing the Housatonic river to New York, in an open canal, and an act of incorporation was obtained in Connecticut for this purpose. The Sharon Canal Company was chartered by the State, and among its duties was that of supplying the city with water. The work was not, however, undertaken.

1824. Mr. White made his report in favor of bringing the water of the Bronx to the city, taking it from the river at the Westchester cotton factory pond. The cost of bringing the water to a reservoir, near the Park, was estimated at one million nine hundred and forty-nine thousand five hundred and forty-two dollars.

1825. A company, called the New York Water Works Company, was incorporated by the legislature, with authority to supply the city with pure water. Canvas White was appointed engineer to this company, and in his report he recommended taking the water of the Bronx, at Underhill's bridge, at an estimated expense of one million four hundred and fifty thousand dollars.

1826. The charter of the New York Water Works Company proved so defective in practice, that they were unable to proceed under it, and applied to the legislature for necessary amendments, in which they were opposed by the Sharon Canal Company, who claimed, in their charter, all the water on the route of the canal.

1827. The Water Works Company, unable to proceed, surrendered their charter; and the legislature incorporated the "New York Well Company." The water was to be procured on the island by sinking wells in the most elevated grounds. The company made several attempts to procure water, but being satisfied, by their experiments, of the impracticability of the undertaking, the enterprise was abandoned.

1828. Levi Disbrow's plan of sinking an Artesian well and reservoir in each ward of the city, was the next plan. Though partially successful, the cost and uncertainty of supply forbade the prosecution of this plan.

1829. A report was made to the Common Council, by Alderman Samuel Stevens, in favor of the establishment of a well and reservoir in Fourteenth street, whence water might be distributed in iron pipes, was accepted and acted upon. The committee did not omit to urge, as an additional motive for laying down iron pipes, that whenever the long desired object of supplying the city with water, for domestic purposes, should be carried into effect, these same pipes would serve. A reluctant assent was wrung from the Common Council to these recommendations, and a committee was empowered to provide the necessary site for a reservoir, and to contract for iron pipes. From this reluctant, feeble, and economical beginning, sprung the Croton Aqueduct.

1830. A motion was made in the Common Council, to apply to the legislature, for all needful power to supply the city with water, and to create two millions of stock to defray the expenses thereof, but did not prevail. May 17, a memorial from Francis B. Phelps, proposed, from different sources of supply, *First*, to bring the water from Rye Pond, the whole distance through, in twenty-eight inch iron pipes; *Second*, to bring the Croton river, by open canal, or by iron pipes; *Third*, to bring the water of the Passaic, taken above the falls, at Patterson, New Jersey, and cross the Hudson by iron pipes laid on the bottom of the river; *Fourth*, by a plan of his own, probably, wells and springs on the island.

1831. The Common Council referred the subject, with the various communications, to their Committee on Fire and Water, in the Board of Aldermen, consisting of Messrs. James Palmer, Samuel Stevens, and William Scott, who presented a report, adducing facts and arguments sufficient to prove the practicability of the project, and the ability of the Corporation to meet the expense; and appended to their report, was a letter directed to the Corporation, and signed, Cyrus Swan, who is "President of the New York and Sharon Canal Company," in which it is asserted, that

that river, (the Croton,) can be carried into the city of New York, and that without it, a supply, which shall be adequate to the present and future wants of the city, cannot be obtained.

1832. The Committee drafted an "Act" for the legislature to pass, which was approved by the Common Council, and presented to the legislature, but which failed in becoming a law. In November, a report was made by Timothy Dewey, and William Serrell to Benjamin Wright, Esq., recommending the Bronx as a sufficient source. The above-named Committee on Fire and Water, with Myndert Van Schaick, Esq., at that time a member of the Board of Aldermen, pursued the subject with energy. In December, De Witt Clinton, Esq., of the United States Corps of Engineers, made a report, in which he arrived at the conclusion, that an adequate supply could only be obtained from the Croton river. He proposed an open aqueduct, and estimated the cost at $2,500,000.

1833. February 26. The legislature passed an act, in compliance with the request of the Common Council, providing for the appointment, by the Governor and Senate, of five persons as Water Commissioners, whose duty it was, by said act, declared to be "to examine and consider all matters relative to supplying the city of New York with a sufficient supply of pure and wholesome water, for the use of its inhabitants, and the amount of money necessary to effect that object." This act, giving the first effectual impetus to the work, was drawn up by Myndert Van Schaick, Esq., then a member of the Senate from the city of New York. The following-named gentlemen were appointed under this law, the Board of Water Commissioners—Stephen Allen, William W. Fox, Saul Alley, Charles Dusenberry, and Benjamin M. Brown. The Commissioners were directed to report the result of their examinations, both to the Common Council and the legislature, the city to defray all reasonable expenses. The Common Council having, on the 5th of June, appropriated $5,000, to enable them to carry into effect the objects of the appointment, the Commissioners engaged Canvas White and Major Douglass to undertake the requisite surveys, examinations and estimates. Mr. White was prevented from acting, and Mr. Douglass commenced his surveys late in June, and they occupied him and his party till late in September, and the result was a firm conclusion, that the Croton should be the source of supply. The plan of construction recommended, was a continuous tunnel or aqueduct of masonry.

1834. In February, the Common Council adopted a resolution, accepting the proposal of the Manhattan Company to enter into a negotiation for the sale of the company's immunities, rights, and privileges of every kind, relative to the supply of the city with water. May 2, an act, prepared like the former, by the Hon. Myndert Van Schaick, was passed by the legislature, giving additional powers to the Commissioners, and requiring them to report the result of their investigations to the Common Council, on or before the first day of January, 1836. In case the plan adopted by the Commissioners should be approved of by the Common Council, they should submit it to the electors. It further authorized the Common Council to raise $2,500,000, by the creation of a public fund or stock, to be called "The Water Stock of the city of New York." The Governor and Senate reappointed the same Commissioners, who, after thoroughly examining their former work, decided that the Croton river was the only source that would furnish an adequate supply. The engineers now employed were David B. Douglass, John Martineau, and George W. Cartright. Various plans were again proposed to the Commissioners; among them that of Mr. Bradford Seymour, of Utica, who proposed to erect a permanent dam in the Hudson river, extending from the foot of Amos street to the Jersey shore. Messrs. Martineau and Douglass expressed themselves in favor of a closed aqueduct of masonry, from the Croton, estimating the cost at $5,412,336 72.

1835. A Committee of the Common Council, to whom was referred the report of the Water Commissioners, approved the plan adopted by the Commissioners, and recommended a reference of the subject to the electors at the ensuing election. These resolutions were adopted by the Common Council, and at the election in April, the question was submitted to the electors, with the following result:

| WARDS. | YES. | NO. |
|---|---|---|
| 1st | 1,417 | 27 |
| 2d | 1,248 | 25 |
| 3d | 1,456 | 42 |
| 4th | 1,794 | 51 |
| 5th | 1,675 | 152 |
| 6th | 1,305 | 103 |
| 7th | 1,303 | 561 |
| 8th | 1,511 | 702 |
| 9th | 631 | 1,015 |
| 10th | 966 | 1,030 |
| 11th | 880 | 873 |
| 12th | 545 | 136 |
| 13th | 654 | 739 |
| 14th | 1,233 | 209 |
| 15th | 712 | 297 |
| | 17,330 | 5,963 |

To complete this view, and to show that the wards which contributed the largest amount of taxes, gave also the largest vote in favor of the Croton project, a list is annexed from the report of the Comptroller, of the taxes paid by each ward, for the year 1835.

| WARD. | |
|---|---|
| 1st | $256,181 14 |
| 2d | 73,187 38 |
| 3d | 86,828 36 |
| 4th | 50,278 29 |
| 5th | 59,177 02 |
| 6th | 49,315 30 |
| 7th | 57,031 06 |
| 8th | 51,529 09 |
| 9th | 33,698 53 |
| 10th | 26,834 78 |
| 11th | 45,060 17 |
| 12th | 60,032 55 |
| 13th | 15,847 69 |
| 14th | 37,150 06 |
| 15th | 73,451 51 |
| | $965,602 94 |

In three wards, Ninth, Tenth and Thirteenth, the negative vote preponderated. In all the others, the affirmative, by a large majority. As to proportion between taxation and the affirmative vote, the First Ward, paying $246,181, records but 27 negatives against 1,417 affirmative votes; while the Tenth Ward, paying but little more that one tenth the taxes of the First Ward, records 1,030 negative against 936 affirmative votes.

1836. In July, the Common Council ordered pipe to be laid, preparatory to the introduction of the water; and, in October, Mr. Douglass was superseded by the appointment of John B. Jervis, Esq., as Chief Engineer.

1837. Work on the aqueduct commenced in the early part of this year.

1839. The legislature passed an act, requiring Harlem river to be crossed by the aqueduct on a high bridge. In August, the High Bridge was contracted for, at $737,755, conditioned to be finished in August, 1843.

1840. Messrs. Samuel Stevens, John D. Ward, Zebedee Ring, Benjamin Birdsall and Samuel R. Childs, appointed Commissioners by the Governor and Senate.

1841. January 7. A freshet on Croton river, carried away the earth embankment forming a portion of the newly constructed dam, causing a great destruction of property, and the loss of three lives.

1842. The Common Council formed the Croton Aqueduct Board, by the appointment of Messrs. John L. Lawrence, President; Myndert Van Schaick, Cornelius W. Lawrence, Samuel B. Ruggles, and J. Phillips Phœnix, whose duties were to take charge of such portion of the work as lay south of Fortieth street, including the city distribution, and the collection of the water revenues. On the 27th of June, the water was received through the aqueduct, into the reservoir at Eighty-sixth street, with appropriate ceremonies; and on the Fourth of July the water was introduced into the Distributing Reservoir, on Murray Hill, and the event was hailed by the citizens, with an interest scarcely less than that pervading the whole American people at the remembrance of the event, the anniversary of which was, on that day, celebrated. At an hour when the firing of guns, and the ringing of bells had aroused but few from their slumbers, and ere the rays of the morning sun had gilded the city domes, the waters of the Croton gushed up into the reservoir, and wandered about its bottom as if to examine the magnificent structure, or to find a resting place in the *temple*, toward which they had made a pilgrimage; the national flag floated out from each corner of the reservoir, and, during the day, thousands of the citizens visited it, giving demonstrations of joy and satisfaction at the accomplishment of this great work. October 14. The celebration of the introduction took place, and it was an occasion of unrestrained enthusiasm and joy; multitudes came in from the surrounding country, and from adjacent sister cities, all business was laid aside for the pleasing ceremonies of the day, and the Croton water met with a welcome, which showed that its value was appreciated.

1843. Messrs. Stephen Allen, William W. Fox, Thomas S. Woodruff, Saul Alley, and Charles Dusenbury, were reinstated Commissioners, by the appointment of the Governor and Senate, in place of the late incumbents; and James A. Coffin superseded John L. Lawrence, as President of the Water Board.

1844. The Water Board, this year, consisted of Messrs. James A. Coffin, President; S. B. Ruggles, M. Van Schaick, Horatio Allen, and Harvey Hunt. Up to this time one hundred and fifty-six miles of distributing pipe had been laid through the streets of this city.

1845. The water revenue, from all sources, amounted, this year, to $164,532.

1848. In May, the water commenced flowing over the

High Bridge, and, on the 23d, Mr. Jas. A. Coffin, President, deceased, when the Hon. Myndert Van Schaick was appointed by the Croton Aqueduct Board to fill the vacancy, which office he continued to fill with popular favor, until November 1, when he was superseded by Uzziah Wenman, Esq., who was appointed to office by the Common Council. June 21, Messrs. Philip Hone, Ambrose C. Kingsland, Nathaniel Weed, J. H. Hobart Hawes, and Marshall O. Roberts, having been nominated by the Governor, and confirmed by the Senate, as Commissioners, took the places of their predecessors. Mr. Van Schaick, in his report to the Common Council, proposed the purchase of ground for a new and much larger reservoir, also recommending a reorganization of the department, for which purpose he presented the draft of a law for the approval of the Common Council.

1849. A new line of thirty inch pipe, through Third avenue and Seventy-ninth street, laid. High Bridge completed, at a cost of $963,427 80. Ward's Island supplied with water. April 11, a law was passed by the legislature, based on that recommended by Mr. Van Schaick, creating the Croton Aqueduct Department, under the provisions of which, the Board of State Commissioners, and the Croton Aqueduct Board, as organized by the Common Council, ceased to exist; and all their powers were vested in the new Board, which was organized on the 18th of July, by the nomination of the Mayor, and appointment, by the Board of Aldermen, of Messrs. Nicholas Dean, as President, Theodore R. De Forest, as Commissioner, and Alfred W. Craven, as Engineer.

1850. The two lines of thirty-six inch pipe, on the Fifth avenue, between Thirty-fourth and Fortieth streets, were lowered, in consequence of a reduction of grade, under the superintendence of Edward H. Tracy, Esq., Assistant Engineer, without breaking joint, at an expense to the city of $12,633 68. This work had been previously estimated to cost from sixty to one hundred thousand dollars. The iron stairway was erected at the High Bridge, and a plot of one hundred acres, immediately north of the Receiving Reservoir, was selected by the Board, as a location for the proposed new reservoir.

1852. The water was drawn off from the Distributing Reservoir for the first time, and the interior thoroughly cleansed; the solid matter on the bottom was less than one inch in depth, when dried; and the work itself, after ten years service, found as perfect as when received from the contractors. An iron bridge, composed of service pipe, was placed over the lip of the dam at Croton lake, which, from the novelty of its construction, constitutes one of the wonders of the locality.

1853. The great line of four feet pipe, being the largest ever laid, was commenced across Manhattan Valley. September 1, Nicholas Dean, Esq., resigned the presidency, and on the 1st December was succeeded by Elias L. Smith, Esq. The entire water receipts, from the introduction, to December 31, was $3,355,534 47; and the whole length of pipe on the island, for supply and distribution, amounted to two hundred and thirty-six miles and two thousand and fifty-one feet.

1854. April 30. A freshet, more extensive than had ever before been known, swept the valley of the Croton river, threatening, in the opinion of many, the destruction of the dam itself, the body of water on the crest of the structure being eight feet four inches deep; the dam, however stood the severe test, but the damages below were very great and the summer was spent in the repair, at a cost of $26,706 29. In May, the Croton Board, consisting of Messrs. Smith, De Forest and Craven, were renominated by Mayor Westervelt, and in July the two last were confirmed, and the nomination of Mr. Smith rejected. Messrs. Edward C. West, Abraham Turnure, and Daniel Dodge, were appointed by the Supreme Court, as Commissioners of Appraisal, for acquiring the land for the new reservoir. The line of four feet pipes, across Manhattan Valley, were completed, and the water let into the same in May.

1855. Mr. E. L. Smith having failed in his confirmation as President of the Board, Mayor Wood nominated the Hon. Myndert Van Schaick to the office, and the nomination was approved. The Eighth avenue line of main pipe, from Eighty-first to Forty-second street, was laid down by days' work, in about one hundred and eighty days, under the superintendence of James P. Kirkwood, Esq., engineer in charge, at an expense of $160,564 24.

1856. The report of the Commissioners, on the appraisal of the land for the new reservoir, after many delays, was presented, and confirmed. The two thirty-six inch mains, on the Eighth avenue, between Forty-ninth and Fifty-fourth streets, were let down through the solid rock, a distance of one thousand three hundred feet in length, and eleven feet in its greatest depth, to conform to the new grade of that part of the city. This work was done without breaking or straining the joints, and proved to the Board a source of natural gratification. The number of buildings in the city, supplied with water, exclusive of those occupied for public purposes, was fifty-three thousand nine hundred and fifty-two. The survey for the new reservoir was commenced under the supervision of George S. Greene, Esq., Engineer in charge.

## SCHEDULE No. 1.

### SHOWING THE WEEKLY RECEIPTS FOR WATER RENTS.

| | | | | | |
|---|---|---|---|---|---|
| 1857. | | | Brought up.. | $208,212 | 85 |
| Jan. 8 | $3,107 | 77 | July 9 | 19,251 | 77 |
| “ 15 | 2,155 | 75 | “ 16 | 43,218 | 70 |
| “ 22 | 1,495 | 50 | “ 23 | 64,739 | 66 |
| “ 29 | 3,312 | 20 | “ 30 | 87,372 | 43 |
| Feb. 5 | 1,716 | 75 | Aug. 6 | 77,973 | 82 |
| “ 12 | 1,999 | 45 | “ 13 | 8,627 | 07 |
| “ 19 | 1,854 | 95 | “ 20 | 7,087 | 38 |
| “ 26 | 1,844 | 50 | “ 27 | 6,246 | 16 |
| Mar. 5 | 3,939 | 27 | Sept. 3 | 7,908 | 20 |
| “ 12 | 3,330 | 68 | “ 10 | 14,950 | 33 |
| “ 19 | 2,123 | 87 | “ 17 | 6,021 | 87 |
| “ 26 | 1,702 | 33 | “ 24 | 6,033 | 92 |
| Apl. 2 | 2,156 | 63 | Oct. 1 | 10,956 | 00 |
| “ 9 | 2,995 | 98 | “ 8 | 6,205 | 26 |
| “ 16 | 2,651 | 22 | “ 15 | 9,317 | 08 |
| “ 23 | 1,569 | 75 | “ 22 | 7,986 | 11 |
| “ 30 | 2,079 | 34 | “ 29 | 11,490 | 99 |
| May 7 | 18,925 | 21 | Nov. 5 | 14,871 | 61 |
| “ 14 | 27,172 | 14 | “ 12 | 9,412 | 92 |
| “ 21 | 17,846 | 75 | “ 19 | 9,205 | 94 |
| “ 28 | 20,815 | 26 | “ 27 | 9,596 | 51 |
| June 4 | 21,524 | 60 | Dec. 3 | 6,767 | 79 |
| “ 11 | 17,470 | 06 | “ 10 | 6,699 | 91 |
| “ 18 | 16,041 | 10 | “ 17 | 9,913 | 18 |
| “ 25 | 14,751 | 56 | “ 24 | 8,048 | 50 |
| July 2 | 13,624 | 23 | “ 31 | 6,477 | 59 |
| Carried up.. | $208,212 | 85 | Total | $684,543 | 55 |

## SCHEDULE No. 2.

### SHOWING THE RECEIPTS FOR PENALTIES ON UNPAID WATER RENTS.

| | | |
|---|---|---|
| 1857. | | |
| Jan. 8........ | $245 | 95 |
| " 15........ | 197 | 85 |
| " 22........ | 100 | 73 |
| " 29........ | 145 | 50 |
| Feb. 5........ | 159 | 60 |
| " 12........ | 138 | 90 |
| " 19........ | 127 | 05 |
| " 26........ | 92 | 10 |
| May 5........ | 180 | 75 |
| " 12........ | 148 | 40 |
| " 19........ | 110 | 15 |
| " 26........ | 101 | 90 |
| Apl. 2........ | 150 | 95 |
| " 9........ | 144 | 98 |
| " 16........ | 96 | 60 |
| " 23........ | 97 | 95 |
| " 30........ | 148 | 65 |
| May 7........ | 248 | 70 |
| " 14........ | 143 | 38 |
| " 21........ | 109 | 35 |
| " 28........ | 127 | 35 |
| June 4........ | 120 | 60 |
| " 11........ | 79 | 05 |
| " 18........ | 79 | 38 |
| " 25........ | 69 | 30 |
| July 2........ | 90 | 15 |
| Carried up... | $3,455 | 27 |
| Brought up... | $3,455 | 27 |
| July 9........ | 90 | 75 |
| " 16........ | 102 | 40 |
| " 23........ | 76 | 90 |
| " 30........ | 75 | 40 |
| Aug. 6........ | 384 | 15 |
| " 13........ | 232 | 98 |
| " 20........ | 196 | 95 |
| " 27........ | 160 | 10 |
| Sept. 3........ | 189 | 68 |
| " 10........ | 1,770 | 50 |
| " 17........ | 149 | 35 |
| " 24........ | 158 | 80 |
| Oct. 1........ | 219 | 00 |
| " 8........ | 169 | 65 |
| " 15........ | 223 | 05 |
| " 22........ | 221 | 60 |
| " 29........ | 366 | 90 |
| Nov. 5........ | 643 | 40 |
| " 12........ | 583 | 45 |
| " 19........ | 540 | 08 |
| " 27........ | 687 | 94 |
| Dec. 3........ | 461 | 32 |
| " 10........ | 396 | 25 |
| " 17........ | 564 | 19 |
| " 24........ | 364 | 35 |
| " 31........ | 372 | 55 |
| Total....... | $12,826 | 96 |

## SCHEDULE No. 3.

### SHOWING THE WEEKLY RECEIPTS FOR PERMITS TO CONNECT WITH SEWERS.

| | | | | | |
|---|---|---|---|---|---|
| 1857. | | | | | |
| Jan. 8........ | $160 | 00 | Brought up.. | $12,218 | 00 |
| " 15........ | 70 | 00 | July 16........ | 380 | 00 |
| " 22........ | 20 | 00 | " 23........ | 372 | 00 |
| Feb. 5........ | 30 | 00 | " 30........ | 450 | 00 |
| " 12........ | 140 | 00 | Aug. 6........ | 580 | 00 |
| " 19........ | 112 | 00 | " 13........ | 485 | 00 |
| " 26........ | 253 | 00 | " 20........ | 553 | 00 |
| Mar. 5........ | 320 | 00 | " 27........ | 467 | 00 |
| " 12........ | 200 | 00 | Sept. 3........ | 320 | 00 |
| " 19........ | 283 | 00 | " 10 ....... | 481 | 00 |
| " 26........ | 430 | 00 | " 17........ | 535 | 00 |
| Apl. 2........ | 380 | 00 | " 24........ | 384 | 00 |
| " 9........ | 830 | 00 | Oct. 1........ | 361 | 50 |
| " 16........ | 860 | 00 | " 8........ | 370 | 00 |
| " 23........ | 790 | 00 | " 15........ | 470 | 00 |
| " 30........ | 1,061 | 00 | " 22........ | 385 | 00 |
| May 7........ | 1,033 | 00 | " 29........ | 220 | 00 |
| " 14........ | 904 | 00 | Nov. 5........ | 290 | 00 |
| " 21........ | 530 | 00 | " 12........ | 309 | 00 |
| " 28........ | 725 | 00 | " 19........ | 230 | 00 |
| June 4........ | 470 | 00 | " 27........ | 290 | 00 |
| " 11........ | 544 | 00 | Dec. 3........ | 170 | 00 |
| " 18........ | 542 | 00 | " 10........ | 344 | 00 |
| " 25........ | 508 | 00 | " 17........ | 450 | 00 |
| July 2........ | 663 | 00 | " 24 ...... | 240 | 00 |
| " 9........ | 360 | 00 | " 31........ | 80 | 00 |
| Carried up... | $12,218 | 00 | Total....... | $21,425 | 50 |

## SCHEDULE No. 4.

### SHOWING THE WEEKLY RECEIPTS FOR PERMITS TO CONSTRUCT VAULTS.

| | | | |
|---|---|---|---|
| 1857. | | | |
| June | 26 | $499 | 79 |
| July | 2 | 34 | 00 |
| “ | 9 | 128 | 37 |
| “ | 16 | 226 | 02 |
| “ | 23 | 375 | 75 |
| “ | 30 | 160 | 91 |
| Aug. | 6 | 37 | 35 |
| “ | 13 | 252 | 00 |
| “ | 20 | 24 | 90 |
| “ | 27 | 209 | 10 |
| Sept. | 3 | 115 | 91 |
| “ | 10 | 315 | 57 |
| “ | 17 | 862 | 63 |
| “ | 24 | 374 | 92 |
| Oct. | 1 | 601 | 50 |
| “ | 8 | 463 | 39 |
| “ | 15 | 528 | 03 |
| “ | 22 | 352 | 21 |
| “ | 29 | 211 | 65 |
| Nov. | 5 | 894 | 21 |
| “ | 12 | 523 | 51 |
| “ | 19 | 435 | 00 |
| “ | 27 | 193 | 69 |
| Dec. | 10 | 1,478 | 31 |
| “ | 17 | 447 | 14 |
| “ | 24 | 97 | 80 |
| “ | 31 | 60 | 24 |
| | Total | $9,901 | 00 |

## SCHEDULE No. 5.

### SHOWING THE AMOUNTS RECEIVED FOR OLD MATERIALS SOLD, &c.

| | | |
|---|---|---|
| For damage done to water pipes, by contractors and others.... . . . . . .... | $76 | 35 |
| " alteration in location of hydrants, for private parties............ ............ | 163 | 33 |
| " old materials sold on account of water pipes and laying...................... | 577 | 72 |
| " refuse paving materials sold, on account of street paving and expenses.............. | 554 | 11 |
| " sale of new materials as patterns, &c..... | 81 | 55 |
| " sale of house at Croton dam, on account of aqueduct repairs and improvements...... | 50 | 00 |
| Total.......................... | $1,503 | 06 |

## SCHEDULE No. 6.

### SHOWING THE PAYMENTS INTO THE CITY TREASURY, AS PER THE RECEIPTS OF THE CITY CHAMBERLAIN.

| | | |
|---|---|---|
| 1857. | | |
| Jan. 8 | $3,513 | 72 |
| “ 15 | 2,423 | 60 |
| “ 22 | 1,616 | 23 |
| “ 29 | 3,457 | 70 |
| Feb. 5 | 1,906 | 35 |
| “ 12 | 2,278 | 35 |
| “ 19 | 2,094 | 00 |
| “ 26 | 2,189 | 60 |
| Mar. 5 | 4,440 | 02 |
| “ 12 | 3,679 | 08 |
| “ 19 | 2,517 | 02 |
| “ 26 | 2,234 | 23 |
| Apl. 2 | 2,811 | 13 |
| “ 9 | 3,970 | 96 |
| “ 16 | 3,607 | 82 |
| “ 23 | 2,457 | 70 |
| “ 30 | 3,288 | 99 |
| May 7 | 20,206 | 91 |
| “ 14 | 28,219 | 52 |
| “ 21 | 18,486 | 10 |
| “ 28 | 21,667 | 61 |
| June 4 | 22,115 | 20 |
| “ 11 | 18,093 | 11 |
| “ 18 | 16,662 | 48 |
| “ 25 | 15,834 | 65 |
| July 2 | 14,411 | 38 |
| Carried up.. | $224,183 | 46 |
| Brought up.. | $224,183 | 46 |
| July 9 | 20,496 | 74 |
| “ 16 | 43,927 | 12 |
| “ 23 | 65,564 | 31 |
| “ 30 | 88,058 | 74 |
| Aug. 6 | 78,945 | 32 |
| “ 13 | 9,597 | 05 |
| “ 20 | 7,811 | 33 |
| “ 27 | 7,082 | 36 |
| Sept. 3 | 8,533 | 79 |
| “ 10 | 17,517 | 40 |
| “ 17 | 7,568 | 85 |
| “ 24 | 6,951 | 64 |
| Oct. 1 | 12,138 | 00 |
| “ 8 | 7,206 | 30 |
| “ 15 | 10,538 | 16 |
| “ 22 | 8,944 | 92 |
| “ 29 | 12,289 | 54 |
| Nov. 5 | 16,699 | 22 |
| “ 12 | 10,819 | 88 |
| “ 19 | 10,411 | 02 |
| “ 27 | 10,768 | 14 |
| Dec. 3 | 7,399 | 11 |
| “ 10 | 8,968 | 47 |
| “ 17 | 11,374 | 51 |
| “ 24 | 8,750 | 60 |
| “ 31 | 7,654 | 04 |
| Total.... | $730,200 | 07 |

## SCHEDULE No. 7.

### AQUEDUCT REPAIRS AND IMPROVEMENTS.

| | | |
|---|---:|---:|
| Appropriation by the Common Council for the year 1857 | $45,000 | 00 |

### DISBURSEMENTS.

| | | |
|---|---:|---:|
| Blacksmiths' work | $86 | 41 |
| Cartage | 1,411 | 12 |
| Casualties | 514 | 14 |
| Cottages on line | 23,847 | 18 |
| Fencing | 728 | 61 |
| Hardware | 181 | 08 |
| Horse hire | 443 | 16 |
| Iron work | 2 | 36 |
| Labor | 8,452 | 79 |
| Law expenses | 29 | 05 |
| Lime, cement and sand | 119 | 83 |
| Lumber | 821 | 80 |
| Oil | 74 | 08 |
| Paint | 154 | 46 |
| Plumbing | 142 | 43 |
| Powder | 24 | 04 |
| Reservoir | 1 | 50 |
| Repairs to Superintendents' dwellings | 1,369 | 97 |
| Seed | 14 | 64 |
| Stone and brick | 96 | 53 |
| Sundry bills | 376 | 30 |
| Surveying | 20 | 00 |
| Taxes | 667 | 43 |
| Carried forward | $39,578 | 91 |

| | |
|---|---|
| Brought forward | $39,578 91 |
| Tools and repairing | 112 23 |

SUPERINTENDENTS' PAY, AS FOLLOWS.

| | |
|---|---|
| Daniel Adamson | $700 01 |
| James Scott | 650 02 |
| Barney See | 575 02 |
| James Bremner | 575 02 |
| James Berwick | 575 02 |
| John L. Berrian | 575 02 |
| Jacob Moore | 575 02 |
| John Geary | 243 32 |
| Ralph Ellis | 461 13 |
| Balance lapsed in city treasury | 379 28 |
| Total | $45,000 00 |

## SCHEDULE No. 8.

### CROTON WATER WORKS EXTENSION.

| | |
|---|---|
| Appropriation by the Common Council, for the year 1857 | $348,000 00 |

### DISBURSEMENTS.

| | |
|---|---|
| Advertising | $503 82 |
| Croton river survey | 4,590 74 |
| Law expenses | 2 10 |
| Miscellaneous bills | 350 00 |
| Sewer, new reservoir | 7,766 52 |
| Surveying " | 5,432 48 |
| Balance lapsed in city treasury | 329,354 34 |
| Total | $348,000 00 |

---

Note.—This large balance is owing to the fact, that the main work on the new reservoir was not commenced at the time intended, it being delayed, as mentioned in the body of the report, by the legal proceedings, instituted by Dinsmore & Wood, *et al.*

## SCHEDULE No. 9.

### WATER PIPES AND LAYING.

| | | |
|---|---|---|
| Appropriation by the Common Council for the year 1857 | $91,300 | 00 |

### DISBURSEMENTS.

| | | |
|---|---|---|
| Advertising | $97 | 07 |
| Blasting | 714 | 55 |
| Brass cocks | 1,230 | 00 |
| Cartage. | 1,109 | 90 |
| Casualties | 727 | 41 |
| Clearing up streets | 430 | 00 |
| Engineer's office | 22 | 99 |
| Fire hydrants | 4,683 | 00 |
| " repairing | 711 | 02 |
| Fuel | 205 | 00 |
| Hydrant and stop-cock boxes | 2,818 | 60 |
| Iron pipe | 14,749 | 62 |
| Lead | 2,588 | 16 |
| Miscellaneous bills | 364 | 13 |
| Office expenses | 760 | 92 |
| Oil | 299 | 40 |
| Paving | 30 | 00 |
| Paving sand | 21 | 75 |
| Postage | 43 | 11 |
| Proving yard | 85 | 41 |
| Reservoir, Distributing | 426 | 08 |
| Small castings | 3,682 | 48 |
| Stationery | 975 | 07 |
| Stop-cocks | 4,650 | 00 |
| Carried forward | $41,425 | 91 |

| | | |
|---|---|---|
| Brought forward | $41,425 | 91 |
| Stop-cocks, repairing | 192 | 88 |
| Tapper's boxes | 469 | 05 |
| Tapping pipes | 1,405 | 00 |
| Tools and repairing | 742 | 74 |
| Wages | 44,415 | 95 |
| Wagon hire | 728 | 88 |
| Water metres | 1,541 | 46 |
| Yarn | 371 | 40 |
| Balance lapsed in city treasury | 6 | 73 |
| Total | $91,300 | 00 |

## SCHEDULE No. 10.

### SEWERS, REPAIRING AND CLEANING.

| | |
|---|---|
| Appropriation by the Common Council, for the year 1857 | $24,000 00 |

### DISBURSEMENTS.

| | |
|---|---|
| Basin and culvert, Chambers st. and Broadway. | $183 50 |
| " " West and Robinson streets. | 366 00 |
| " " Eldridge and Canal streets. | 115 00 |
| Cartage | 5,308 50 |
| Casualties | 50 00 |
| Iron man-hole and culvert cover | 2,296 03 |
| Oil | 68 48 |
| Repairing basins and culverts | 717 55 |
| " man-holes | 1,188 93 |
| " sewers | 241 03 |
| Sundry bills | 239 36 |
| Surveying Eighth avenue sewer | 105 20 |
| Tools and repairing | 22 50 |
| Wages | 8,925 26 |
| Balance lapsed in city treasury | 4,172 06 |
| Total | $24,000 00 |

## SCHEDULE No. 11.

### STATISTICAL TABLES.

| | | |
|---|---|---|
| Balance on hand from former appropriation... | | $1,748 61 |
| **DISBURSEMENTS.** | | |
| For making table of revenue for the report of 1856.................. | $100 00 | |
| Rebinding maps and street registers. | 277 20 | |
| Lithographic stones, and drawing of maps of sewers, and printing.... | 205 30 | |
| Balance to credit of department in Mechanics' Bank............... | 1,166 11 | $1,748 61 |

## SCHEDULE No, 12.

### STREET EXPENSES AND PAVING.

Balance of appropriation of one hundred thousand dollars remaining in the city treasury, at the time of transferring this service to this department.......... $36,525 66

### EXPENDITURES.

| | |
|---|---|
| Bridge stone.................................. | $671 50 |
| Cartage..................................... | 8,338 44 |
| Miscellaneous bills.......................... | 53 44 |
| Paving stones............................... | 81 25 |
| Sand ...................................... | 2,915 74 |
| Tools and repairing........................ | 97 95 |
| Wages..................................... | 23,202 09 |
| Wagon hire................................ | 138 75 |
| Yard expenses............................. | 487 96 |
| Yard rent.................................. | 538 54 |
| Total........................ | $36,525 66 |

## SCHEDULE No. 13.

### SALARIES.

| | | |
|---|---|---|
| Paid Myndert Van Schaick, President........ | $2,000 | 00 |
| Theodore R. De Forest, Commissioner....... | 2,000 | 00 |
| Alfred W. Craven, Engineer................ | 2,000 | 00 |
| John C. Winder, Assistant................. | 1,450 | 00 |
| John P. Flender, Water Purveyor........... | 1,500 | 00 |
| Revo C. Hance, Registrar.................. | 1,500 | 00 |
| William Fardon, Deputy, do. .............. | 1,000 | 00 |
| Henry L. Robertson, Clerk to Board........ | 1,400 | 00 |
| Alexander F. Dodge, Contract Clerk........ | 1,200 | 00 |
| William V. Le Count, Clerk to Registrar.... | 1,000 | 00 |
| Jacob E. Howard, " " .... | 1,000 | 00 |
| Edmund E. Dean, " " .... | 1,000 | 00 |
| Gilbert H. White, " " .... | 1,000 | 00 |
| Seymour V. Moody, " " .... | 1,000 | 00 |
| Charles R. Fleet, " " .... | 1,000 | 00 |
| Joseph B. Young, Clerk to Purveyor......... | 583 | 34 |
| Peter D. De Forest, " ........ | 583 | 34 |
| John J. Concklin, Messenger ............... | 700 | 00 |
| Alex. H. Thompson, do. ............... | 60 | 00 |
| Terence Geary, do. ............... | 120 | 00 |
| Accountant................................ | 700 | 00 |
| Total...................... | $22,796 | 68 |

## SCHEDULE No. 14.

### EXHIBITING THE LEDGER BALANCE, DECEMBER 31, 1857.

| HEADS OF ACCOUNT. | DR. | CR. |
|---|---|---|
| Aqueduct Repairs and Improvements | $44,620 72 | $45,000 00 |
| Croton Water Works Extension | 18,645 66 | 348,000 00 |
| Water Pipes and Laying | 91,293 27 | 91,300 00 |
| Sewers, Repairing and Cleaning | 19,827 94 | 24,000 00 |
| Statistical Tables | 582 50 | 1,748 61 |
| Street Expenses and Paving | 36,525 66 | 36,525 66 |
| Salaries | 22,796 68 | 22,796 68 |
| Water Rents | ............ | 684,543 55 |
| " " Penalties thereon | ............ | 12,826 96 |
| Permits to enter sewers | ............ | 21,425 50 |
| " to construct vaults | ............ | 9,901 00 |
| Petty Cash | ............ | 1,503 06 |
| City Chamberlain | 730,200 07 | ——— |
| Unexpended Balances | 335,078 52 | ——— |
|  | $1,229,571 02 | $1,229,571 02 |

## REPORT OF THE CHAIRMEN OF THE COMMITTEES ON CROTON AQUEDUCT, ON THE TRANSACTIONS OF THE DEPARTMENT, PRESENTED IN BOTH BOARDS, NOVEMBER 27, 1857.

The undersigned, Chairmen of the Committees on Croton Aqueduct, respectfully

REPORT:

That in pursuance of the directions of the sixth section of the act of the legislature of the 11th of April, 1849, entitled, " An act to create the Croton Aqueduct Department in the city of New York," they have visited the works, and have minutely and thoroughly investigated the entire business transactions of that department, for the year commencing on the 1st of November, 1856, and ending October 31st, 1857.

The books and accounts have been carefully scrutinized, and the cash receipts found to be balanced by corresponding certificates of deposit with the County Treasurer; and every expenditure is verified by a sufficient and satisfactory voucher.

The officers of that department have facilitated this examination by every means in their power, and in the most prompt and cheerful manner.

The undersigned have pursued their inquiries to a gratifying conclusion; and are fully convinced that the business of the Croton Aqueduct Department is ably, judiciously, and honestly conducted; that the methodical arrangement of its diverse duties and responsibilities, and the practical workings of its several divisions, in one efficient and harmonious system, make it, pre-eminently, a model department of the public service.

PETER MONEGHAN,
*Chairman Committee Board of Aldermen.*
BENJ. T. RHODES,
*Chairman Committee Board of Councilmen.*

Which was adopted.

Bureau of Pipes, Sewers and Pavements,
December 31, 1857.

The Water Purveyor respectfully submits the following statement of the work performed in this bureau, during the year 1857. It is arranged under the several heads, to wit:

Construction of Sewers.
Laying of Water Pipes.
Street Pavements.
Wells and Pumps.
Vault Permits, and
Repairs to Street Pavements.

Very respectfully,
Your obedient servant,
JOHN P. FLENDER,
*Water Purveyor.*

# SCHEDULE No. 15.

## CONSTRUCTION OF SEWERS.

**Statement showing the locality, size and length of all sewers, with the receiving basins and culverts attached to each, for which contracts have been made during the year 1857.**

| STREET. | BETWEEN. | SIZE. | LENGTH FEET. | BASINS AND CULVERTS. |
|---|---|---|---|---|
| Bowery | Roosevelt and Franklin square. | 4x2 ft. 8 in. | 1030 | 5 |
| Do | James and East Broadway | | | |
| Greene | Amity and Bleecker | " | 420 | |
| Clinton | Broome and Grand | " | 230 | |
| Forty-ninth | Second and Third avenues | " | 580 | 2 |
| Fifty-fourth | 4th av. and 450 feet west of 5th av. | " | 1640 | 4 |
| Thirteenth | University place and Broadway. | .............. | 650 | |
| Broadway | Twelfth and Thirteenth streets. | | | |
| Menroe | Catharine and Market | " | 580 | |
| Mulberry | Bayard and Canal | " | 455 | |
| Barrow | West Washingten pl. & Bleecker. | " | 470 | 2 |
| Forty-seventh | Fifth and Seventh avenues | " | 1870 | 2 |
| Bleecker | Bank street and Eighth avenue | " | 79 | |
| Thirty-seventh | Lexington and Fourth avenues | " | 396 | |
| Bowery | James and Madison | " | 330 | |
| Dutch | Fulton and John | " | 190 | |
| Hudson | Barrow and Grove | " | 230 | |
| William | Northeast corner of Frankfort | .............. | .... | 1 |
| Robinson | East corners of West, | .............. | .... | 2 |
| Broadway | Southeast corner of Chambers | .............. | .... | 1 |
| Total | | | 9150 | 19 |

The following work has been completed at private expense:

| | FEET. |
|---|---|
| Troy street, sewer extended to new bulkhead | 500 |
| West Twenty-third street, do. do. | 600 |
| Twenty-first, do. at intersection of Broadway | 180 |
| Total | 1280 |

## RECAPITULATION.

| | FEET. |
|---|---|
| Of sewers by contract | 9,150 |
| Do. at private expense | 1,280 |
| Total | 10,430 |

Or two miles, less 130 feet.

## SCHEDULE No. 16.

### SEWERS.

Construction under the direction of the Croton Aqueduct Department, since its organization in 1849.

| | | | |
|---|---|---|---|
| 1849. | Number of sewers | 25 | |
| | “ basins and culverts | 58 | |
| | Lineal feet in length | | 16,165 |
| 1850. | Number of sewers | 70 | |
| | “ basins and culverts | 173 | |
| | Lineal feet in length | | 61,579 |
| 1851. | Number of sewers | 105 | |
| | “ basins and culverts | 157 | |
| | Lineal feet in length | | 63,009 |
| 1852. | Number of sewers | 100 | |
| | “ basins and culverts | 196 | |
| | Lineal feet in length | | 65,689 |
| 1853. | Number of sewers | 85 | |
| | “ basins and culverts | 256 | |
| | Lineal feet in length | | 73,542 |
| 1854. | Number of sewers | 88 | |
| | “ basins and culverts | 244 | |
| | Lineal feet in length | | 73,519 |
| 1855. | Number of sewers | 65 | |
| | “ basins and culverts | 110 | |
| | Lineal feet in length | | 38,679 |
| 1856. | Number of sewers | 73 | |
| | “ basins and culverts | 121 | |
| | Lineal feet in length | | 49,280 |
| 1857. | Number of sewers | 23 | |
| | “ basins and culverts | 19 | |
| | Lineal feet in length | | 10,430 |

Total—85 miles, 2,042 feet.

## SCHEDULE No. 17.

### WATER PIPES.

The following lines of main pipes have been laid during the year 1857:

### SIX INCH.

| STREET. | BETWEEN. | FEET. |
|---|---|---|
| Bowery | Oliver and Oak streets | 2,210 |
| First avenue | 111th and 114th streets | 850 |
| Third " | intersection of 83d street | 50 |
| Fourth " (west side) | 34th and 41st streets | 1,723 |
| Do. " (east side) | 34th and 42d streets | 2,044 |
| Do. " (west side) | from 90th street, southerly | 161 |
| Seventh " | 54th and 55th streets | 200 |
| Eleventh " | 39th and 40th streets | 255 |
| Do. " | 42d and 43d streets | 255 |
| Thirty-fourth street | Lexington and 4th avenues. | 481 |
| Do. " | 4th avenue, westerly | 150 |
| Thirty-fifth " | " " | 200 |
| Do. " | " easterly | 50 |
| Thirty-sixth " | " " | 37 |
| Do. " | " westerly | 34 |
| Do. " | 2d av., and 375 feet west | 382 |
| Do. " | 10th av. and 400 feet west | 297 |
| Thirty-seventh " | 4th avenue, westerly | 250 |
| Do. " | Do. easterly | 250 |
| Thirty ninth " | 4th avenue, westerly | 48 |
| Do. " | 10th avenue, and 600 ft. west. | 637 |
| Do. " | 500 ft. w. of 11th av. & N.R. | 467 |
| Fortieth " | 4th avenue, westerly | 46 |
| Do. " | Do. easterly | 32 |
| Carried forward | | 11,109 |

| STREET. | BETWEEN. | FEET. |
|---|---|---|
| Brought forward | | 11,109 |
| Fortieth | 11th av. and North river | 952 |
| Forty-first | 4th avenue, westerly | 34 |
| Do. | " easterly | 25 |
| Forty-fifth | 150 ft. E. 2d av. and E. riv. | 1,258 |
| Do. | 6th avenue and 50 feet east. | 50 |
| Do. | 100 feet west of 6th avenue, and 500 feet east 6th av. | 600 |
| Forty-sixth | 6th av., and 250 feet east | 255 |
| Fiftieth | 8th and 9th avenues | 850 |
| Fifty-second | 2d and 3d avenues | 850 |
| Fifty-third | Broadway and 8th avenue | 680 |
| Fifty-fifth | 3d avenue and 425 ft. east | 425 |
| Seventieth | Do., and 600 feet west | 600 |
| Ninetieth | 4th avenue, easterly | 187 |
| Do. | Do. westerly | 471 |
| One hund. & fourteenth | 1st and 3d avenues | 1,785 |
| Total | | 20,131 |

TWELVE INCH.

| STREET. | BETWEEN. | FEET. |
|---|---|---|
| Second avenue | 45th and 48th streets | 795 |
| Thirty-eighth street | 10th and 11th avenues | 892 |
| Forty-eighth | 1st and 2d avenues | 807 |
| Do. | 9th av., and 550 feet west | 595 |
| Total | | 3,089 |

## RECAPITULATION.

| | FEET. |
|---|---|
| Of six inch mains | 20,131 |
| " twelve, do. | 3,089 |
| Total | 23,220 |

or four miles and 2,100 feet.

### VAULT PERMITS.

For permits to construct vaults, there has been received, from the 21st day of May, 1857, to this date, the sum of $9,901 00, for which see Schedule No. 4.

### STREET PAVEMENTS—NEW WORK.

Under this head, a contract for the paving of the new Bowery, and parts of the intersecting streets has been awarded; and Twenty-first and Twenty-second streets, west of Tenth avenue, have been paved, at private expense; no other work has been done.

### WELLS AND PUMPS.

The exhaustion of the appropriation under this head, before the control of the work was transferred to this department, has prevented the prosecution of any new work.

## SCHEDULE No. 18.

### PIPE OF ALL SIZES, FOR THE SUPPLY AND DISTRIBUTION OF CROTON WATER, TO DECEMBER 31, 1857.

| TIME. | 48. | 36. | 30. | 24. | 20. | 16. | 12. | 10. | 6. | 4. | TOTALS. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Prev. to July 1849 | ..... | 60,333 | 25,796 | 5,400 | 20,275 | 13,125 | 225,140 | 5,875 | 668,107 | ..... | 1,024,051 ft., or 193 miles 5,011 ft. |
| July to Dec. " | ..... | ...... | ...... | ..... | ...... | 958 | 2,430 | ..... | 9,402 | 7,451 | 20,236 " " 3 " 4,396 " |
| Jan. to Dec., 1850 | ..... | 545 | 2,040 | ..... | 4,860 | ...... | 2,375 | ..... | 30,539 | 969 | 41,328 " " 7 " 4,368 " |
| " " 1851 | ..... | ...... | ...... | ..... | 2,721 | ...... | 18,739 | ..... | 42,817 | 923 | 65,199 " " 12 " 1,839 " |
| " " 1852 | ..... | ...... | ...... | ..... | 3,650 | ...... | 12,171 | ..... | 47,714 | ..... | 63,535 " " 12 " 175 " |
| " " 1853 | 3,500 | ...... | 5,125 | ..... | ...... | ...... | 996 | ..... | 24,161 | ..... | 33,782 " " 6 " 2,102 " |
| " " 1854 | 587 | ...... | ...... | ..... | 1,765 | ...... | 5,000 | ..... | 23,223 | ..... | 30,575 " " 5 " 4,275 " |
| " " 1855 | ..... | ...... | 10,582 | ..... | 1,492 | ...... | 6,063 | ..... | 18,784 | ..... | 36.921 " " 6 " 5,141 " |
| " " 1856 | ..... | ...... | 1,319 | ..... | 102 | ...... | 2,731 | ..... | 25,702 | 129 | 29,983 " " 5 " 3,583 " |
| " " 1857 | ..... | ...... | ...... | ..... | ...... | ...... | 3,089 | ..... | 20,131 | ..... | 23,220 " " 4 " 2,100 " |
| | 4,087 | 60,878 | 44,862 | 5,400 | 34,864 | 14,078 | 278,764 | 5,875 | 919,576 | 9,472 | 1,368,830 ft., or 259 miles 1,310 ft. |

The present department was organized in July, 1849. The first line in the table gives the quantity in use at that time; the others, the quantity laid each year since. The figures at the head of the columns indicate the internal diameter of pipes, in inches.

# SCHEDULE No. 19.

## REPAVING RETURNS.

| DATE. | STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. | REMARKS. |
|---|---|---|---|---|---|
| June 8 to 13, '57. | Twenty-third. | Eighth and Ninth avenues.... | 16 | 10 | Generally repaired. |
| " 15 to 27.... | Do ....... | Seventh and Eighth avenues.. | 96 | 20 | " |
| " 15 to July 11 | Greenwich ... | Canal and Hubert | 212 | 38 | |
| | Washington.. | Laight and Beach | | | |
| | Laight....... | Greenwich and Washington | | | |
| | Hubert...... | Washington and West | | | |
| June 29 to July 11 | Twenty-third. | Fifth and Seventh avenues.... | 65 | 30 | |
| July 11 to 25..... | Greenwich.... | Laight and Hubert.......... | 22 | 1 | General repairing. |
| | Do........ | Beach and Hubert .......... | 18 | 3 | |
| | Laight....... | Greenwich and Washington... | 15 | 2 | |
| | Washington.. | Laight and Hubert.......... | 18 | 3 | |
| | Do........ | North Moore and Franklin... | 9 | | |
| | Greenwich.... | do. .......... | 28 | 2 | |
| | Washington.. | Franklin and Harrison....... | 12 | ...... | |
| | Twenty-third. | Fifth and Lexington avenues.. | 78 | 40 | |
| | Washington.. | Franklin and Harrison....... | 22 | 3 | |
| | Do....... | Harrison and Jay.......... | 17 | 4 | |
| | Jay......... | Greenwich and Washington... | 12 | 3 | |
| | Do ....... | West and Washington....... | 2 | 2 | |
| | Washington.. | Jay and Duane............ | 12 | 2 | |
| July 13 to 25 .... | Do....... | Reade and Duane........... | 21 | 1 | |

| | | | | | |
|---|---|---|---|---|---|
| July 27 to Aug. 8. | Greenwich ... | Franklin and Harrison....... | 21 | 5 | General repairing. |
| | Harrison .... | Hudson and Washington..... | 6 | ....... | " |
| | Madison av... | Twenty-seventh & Thirty-first. | 68 | 76 | " |
| | Seventh av... | Thirty-fourth and Thirty-sixth. | 76 | 123 | " |
| | Forsyth...... | Grand and Hester........... | 21 | 13 | Repairing. |
| | Hester....... | Forsyth and Eldridge........ | 20 | 16 | " |
| | Forsyth...... | and Hester................. | 6 | 7 | " |
| | Do ....... | Grand and Hester........... | 3 | 5 | " |
| | Hester ...... | Forsyth and Eldridge........ | 10 | 12 | " |
| | Eldridge..... | Hester and Canal........... | 10 | 12 | " |
| | Forsyth ..... | do. ........... | 10 | 8 | " |
| | Hester....... | Eldridge and Allen.......... | 5 | 1 | " |
| | Eldridge..... | Hester and Canal........... | 16 | 3 | " |
| | Forsyth...... | do. ........... | 11 | 2 | " |
| | Bleecker..... | Greene and Mercer.......... | 32 | 6 | General repairs. |
| | Do ........ | Mercer and Broadway....... | 33 | 9 | " |
| | Houston..... | Broadway and Thompson..... | 43 | 17 | " |
| | Laurens...... | Bleecker and Houston.... .. | 18 | 3 | " |
| | Amity ...... | Mercer and Sixth avenue..... | 116 | 20 | " |
| | West ....... | Battery and Morris.......... | 14 | 1 | " |
| | Morris ...... | West and Greenwich ........ | 19 | 1 | " |
| | Washington.. | Battery and Rector.......... | 30 | 10 | " |
| | West........ | Morris and Rector .......... | 47 | 2 | " |
| | Wall........ | Broad and New............. | 24 | 7 | " |
| | Greenwich ... | Cedar and Albany .......... | 18 | ..... | " |
| | Albany...... | Greenwich and Washington... | 16 | 2 | " |
| | Greenwich ... | Albany and Morris.......... | 64 | 29 | " |
| | Wall........ | Broadway and Broad......... | 19 | 12 | " |
| | Avenue A ... | Fourth and Twenty-third..... | 147 | 33 | " |
| | Eighth avenue | Hudson and Twenty-third.... | 234 | 3 | " |
| | Sixth do. | Thirty-fifth and Thirty-seventh. | 69 | 37 | " |

## SCHEDULE No. 19—CONTINUED.

| DATE. | STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. | REMARKS. |
|---|---|---|---|---|---|
| July 27 to Aug. 8. | Broadway ... | Nineteenth and Twenty-first.. | 81 | 45 | General repairs. |
| Aug. 10 to 22.... | Greenwich . . | Harrison and Jay........... | 45 | 15 | Repairs. |
| | West........ | Reade and Hubert........... | 109 | 31 | " |
| | Seventh av... | Twenty-sixth and Thirty-fourth | 88 | 103 | " |
| | Forsyth...... | Hester and Canal........... | 55 | 25 | " |
| | Ludlow...... | Canal and Broome........... | 62 | 36 | " |
| | Delancey ... | Orchard and Allen.......... | 1 | ...... | " |
| | East Broadw'y | Catharine and Market....... | 44 | 27 | " |
| | Houston..... | Thompson and Sullivan...... | 22 | 7 | " |
| | Do ....... | Sullivan and Cottage place... | 25 | 11 | " |
| | Hamersley.... | Houston and Varick......... | 1 | 1 | " |
| | Bedford ..... | Houston and Downing....... | 49 | 9 | " |
| | Downing..... | Bedford and Varick......... | 2 | 1 | " |
| | Bedford...... | Downing and Carmine....... | 44 | 9 | " |
| | Bleecker..... | Carmine and Leroy.......... | 40 | ...... | " |
| | Amity ...... | Macdougal and Sixth avenue.. | 18 | 7 | " |
| | Greenwich av. | Sixth avenue and Hammond.. | 63 | 14 | " |
| | West Tenth.. | West Tenth and Bleecker.... | 78 | 13 | " |
| | West........ | Rector and Cedar........... | 81 | 51 | " |
| | Cedar........ | West and Greenwich ........ | 16 | 10 | " |
| | Washington.. | Cedar and Liberty .......... | 13 | 6 | " |
| | Albany...... | West and Washington....... | 15 | 6 | " |
| | Greenwich ... | Rector and Battery.......... | 52 | 26 | " |
| | Cortlandt.... | Broadway and Greenwich.... | 19 | 14 | " |
| | Front ....... | Whitehall and Old slip....... | 70 | 22 | " |

| | | | | | |
|---|---|---|---|---|---|
| Aug. 10 to 22.... | Houston..... | Sheriff and Willett.......... | 10 | 2 | General repairs |
| | Avenue C.... | Second and Third........... | 6 | 1 | Repairs. |
| | Houston..... | Sheriff and Orchard......... | 104 | 22 | " |
| | Dry Dock.... | Tenth and Twelfth.......... | 20 | 5 | " |
| | Tenth........ | Avenues C and D........... | 16 | 2 | " |
| | Eleventh..... | " and Dock........ | 15 | 3 | " |
| | Twelfth...... | " and " ........ | 21 | 3 | " |
| | Avenue D.... | Eighth and Tenth........... | 20 | 4 | " |
| | Eighth....... | Avenue D and Lewis........ | 8 | 0 | " |
| | Lewis....... | Sixth and Eighth........... | 12 | 2 | " |
| | Sixth avenue. | Thirty-seventh and Forty-first. | 51 | 30 | " |
| | Broadway.... | Twenty-first and Twenty-fifth. | 99 | 45 | " |
| Aug. 24 to Sept. 5. | West ....... | Beach and Hoboken......... | 163 | 39 | " |
| | Washington.. | Desbrosses and Hoboken..... | 24 | 12 | " |
| | Fourth avenue | Sixteenth and Twenty-fifth.... | 144 | 38 | " |
| | Seventh av... | Fifteenth and Twenty-sixth... | 146 | 90 | " |
| | East Broadw'y | Catharine and Market........ | 154 | 90 | " |
| | Market...... | Division and Henry ......... | 6 | 7 | " |
| | East Broadw'y | Market and Pike............ | 9 | 5 | " |
| | Bleecker..... | Leroy and Commerce........ | 30 | 4 | " |
| | Morton...... | Bedford and Bleecker........ | 1 | ...... | " |
| | Bleecker..... | Commerce and Barrow....... | 29 | 4 | " |
| | Do. .... | Barrow and Grove .......... | 14 | 2 | " |
| | Barrow ..... | Bleecker and Bedford........ | 2 | ...... | " |
| | Christopher... | do. ........ | 3 | 1 | " |
| | Bleecker..... | Grove and Perry........... | 39 | 16 | " |
| | Charles ..... | Bleecker and Hudson........ | 12 | 2 | " |
| | Bleecker..... | Charles and Hammond....... | 25 | 7 | " |
| | West Tenth.. | Bleecker and West.......... | 44 | 10 | " |
| | Greenwich ... | Troy and Charles ........... | 123 | 35 | " |
| | West ....... | Cedar and Cortlandt......... | 28 | 14 | " |

## SCHEDULE No. 19—Continued.

| DATE. | STREET. | BETWEEN. | LOADS SAND. | LOADS STNNE. | REMARKS. |
|---|---|---|---|---|---|
| Aug. 24 to Sept. 5. | Cortlandt | West and Washington | 29 | 20 | General repairs. |
| | West | Cortlandt and Robinson | 15 | ...... | Patching. |
| | Washington | Cortlandt and Dey | 15 | ...... | " |
| | West | Murray and Warren | 19 | 2 | " |
| | Do. | Robinson and Murray | 32 | 10 | " |
| | Warren | West and Washington | 9 | 4 | " |
| | South | Peck slip and Fulton | 11 | 6 | General repairing. |
| | Front | Old slip and Wall | 14 | 3 | |
| | Wall | Front and Nassau | 132 | 85 | |
| | Lewis | Fifth and Delancey | 91 | 11 | |
| | Water | Dover and Burling slip | 138 | 28 | |
| | Sixth avenue | Thirty-second and Fortieth | 40 | 29 | |
| | Fortieth | Fifth and Sixth avenues | 5 | 14 | |
| | Broadway | Twenty-fourth and Twenty-sev. | 89 | 47 | |
| Sept. 7 to 18 | Washington | Watts and Desbrosses | 27 | 9 | General repairing. |
| | Greenwich | Canal and Spring | 24 | 19 | " |
| | Canal | near Greenwich | 6 | 1 | " |
| | Hudson | Canal and Spring | 27 | 1 | " |
| | Do. | Spring and Dominick | 19 | 1 | " |
| Sept. 7 to 19 | Fourth avenue | Twenty-fourth and Thirty-sec'd | 102 | 21 | " |
| | Seventh, do | Fifteenth st. and Greenw'h av. | 143 | 78 | |
| | East Broad'y | Market and Rutgers | 122 | 62 | General repairs. |
| | Bleecker | Perry and Eighth avenue | 29 | 6 | " |
| | Hammond | Bleecker and Fourth | 12 | 4 | " |
| | Fifth avenue | Waverley place and Sixteenth | 61 | 14 | " |

| | | | | | |
|---|---|---|---|---|---|
| Sept. 7 to 19 | Greenwich | Perry and Charles | 27 | 12 | General repairs. |
| | Charles | Greenwich and Washington | 14 | 7 | " |
| | Greenwich | Charles and Barrow | 74 | 27 | " |
| | South | Peck slip and Coenties slip | 143 | 37 | |
| | Wall | William and Nassau | 14 | 12 | |
| | Pearl | Beaver and Hanover | 13 | 8 | Patching. |
| | Front | Wall and Burling slip | 79 | 30 | Repairs. |
| | Maiden lane | South and Front | 7 | 5 | " |
| | Water | Fulton and Burling slip | 20 | 3 | " |
| | Front | Roosevelt and do | 174 | 24 | " |
| | Fortieth | Fifth and Sixth avenues | 206 | 48 | |
| | Broadway | Twenty-sixth and Thirtieth | 69 | 66 | |
| Sept. 21 to Oct. 3 | Hudson | Spring and Broome | 18 | ...... | General repairs. |
| | Watts | Hudson and Varick | 7 | ...... | " |
| | Hudson | Spring and Vandam | 41 | ...... | " |
| | Spring | Hudson and Varick | 2 | ...... | " |
| | Hudson | Vandam and Hamersley | 99 | ...... | " |
| | Thirty-second | Lexington and Fourth avenues | 13 | ...... | " |
| | Fifth avenue | Twenty-third and Thirty-third | 133 | 50 | " |
| | Forty-second | Fifth and Sixth avenues | 56 | 47 | " |
| | East Broad'y | Pike and Clinton | 182 | 120 | " |
| | Broadway | Fourteenth and Houston | 25 | ...... | Repairing Russ pavement. |
| | Greenwich | Christopher and Clarkson | 130 | 60 | Patching. |
| | Clarkson | Hudson and Greenwich | 12 | 3 | " |
| | South | Cuyler's alley and Coenties slip | 30 | 4 | General repairs. |
| | Coenties slip | South and Front | 40 | 12 | " |
| | Church | Fulton and Vesey | 32 | 13 | " |
| | South | Coenties slip and Whitehall | 37 | 8 | " |
| | Pearl | State and Broad | 29 | 10 | " |
| | Maiden lane | South and William | 156 | 61 | And fifteen truck loads. |
| | East Broad'y | Clinton and Scammel | 240 | 91 | |

## SCHEDULE No. 19—CONTINUED.

| DATE. | STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. | REMARKS. |
|---|---|---|---|---|---|
| Sept. 21 to Oct. 3. | Fortieth | Fifth and Sixth avenues | 42 | 16 | |
| | Sixth avenue | Twenty-eighth and Thirty-sec'd | 63 | 7 | |
| | Broadway | Do. | 74 | 73 | |
| October 5 to 17 | Hudson | King and Barrow | 82 | 8 | Patching. |
| | Morton | Hudson and Bedford | 4 | 1 | " |
| | Hudson | Barrow and Hammond | 49 | 3 | |
| | Fifth avenue | Sixteenth and Twenty-second | 65 | 28 | |
| | Thirteenth | University place and Fifth av. | 9 | 7 | |
| | University pl. | Twelfth and Thirteenth | 15 | 5 | |
| | Thirteenth | University place and Broadw'y | 3 | 3 | |
| | Twenty-fifth | First avenue and river | 22 | 4 | |
| | Fifth avenue | Thirty-third and Forty-second | 37 | 49 | |
| | East Broad'y | Jefferson and Clinton | 112 | 92 | |
| | Pearl | Chatham and City Hall place | 14 | 14 | |
| | Market | Cherry and Hamilton | 8 | 6 | |
| | Broadway | Bleecker and Grand | 34 | ...... | Repairing Russ pavement. |
| | Clarkson | Greenwich and Washington | 17 | 6 | Patching. |
| | Greenwich | Clarkson and Hamersley | 16 | 6 | " |
| | Hamersley | Hudson and Greenwich | 15 | 6 | " |
| | Do. | Do. and Washington | 30 | 13 | " |
| | Greenwich | Hamersley and Charlton | 67 | 26 | " |
| | Pearl | Broad and Coenties slip | 17 | 6 | Repairs. |
| | Bridge | Broad and State | 18 | 5 | |
| | Stone | Whitehall and Broad | 13 | 6 | |
| | Pearl | Old slip and Coenties slip | 15 | 6 | |

| | | | | | |
|---|---|---|---|---|---|
| Oct. 5 to 17...... | William ..... | South and Wall............. | 37 | 4 | |
| | Pearl ....... | William and Cedar.......... | 24 | 3 | |
| | Liberty ..... | William and Broadway...... | 27 | 5 | |
| | John ........ | Pearl and William.......... | 17 | 4 | |
| | William ..... | John and Ann ............... | 16 | 4 | |
| | Maiden lane.. | William and Broadway ..... | 55 | 42 | |
| | John ........ | Nassau and Broadway....... | 32 | 20 | |
| | Murray ..... | West and Greenwich........ | 37 | 38 | |
| | East Broad'y. | Gouverneur and Scammel..... | 13 | 5 | |
| | Catharine ... | Front and Henry........... | 157 | 42 | |
| | Sixth avenue. | Eighteenth and Twenty-eighth. | 129 | 21 | |
| | Broadway.... | Thirty-first and Thirty-eighth. | 72 | 68 | |
| Oct. 19 to 31..... | Hudson ..... | Hammond and Thirteenth.... | 57 | 8 | Patching. |
| | Gansevoort... | Hudson and Thirteenth ..... | 3 | ...... | " |
| | Hudson ..... | Thirteenth street and Ninth av. | 16 | 2 | " |
| | Ninth avenue. | Fourteenth and Seventeenth.. | 24 | 3 | " |
| | Twenty-fifth.. | First avenue and East river... | 14 | 3 | |
| | Do. .. | First and Second avenues..... | 18 | 1 | |
| | First avenue.. | Twenty-third and Twenty-sixth | 45 | 12 | |
| | Fifth, do. .. | Thirty-third & Forty-second | 145 | 16 | |
| | Sixth, do. .. | Amity and Thirteenth ..... | | | |
| | Market...... | Hamilton and East Broadway. | 98 | 56 | |
| | Pearl........ | Chatham and Centre......... | 45 | 36 | |
| | James...... | Oak and Water............. | 36 | 30 | |
| | Water ...... | James slip and Roosevelt..... | 37 | 26 | |
| | Roosevelt.... | Oak and Front.............. | 57 | 33 | |
| | Water....... | James slip and Oliver........ | 10 | 6 | |
| | Broadway.... | Grand and Howard.......... | 13 | ...... | Repairing. |
| | Grand ....... | Broadway and Centre........ | 1 | ...... | Repairing Belgian pavement. |
| | Broadway.... | Franklin and Worth......... | 12 | ...... | Repairing Russ pavement. |
| | Charlton .... | Greenwich and Washington... | 14 | 6 | Patching. |

## SCHEDULE No. 19—CONTINUED.

| DATE. | STREET. | BETWEEN. | LOADS SAND. | LOADS STONE. | REMARKS. |
|---|---|---|---|---|---|
| October 19 to 31 | Greenwich | Charlton and Spring | 25 | 15 | Patching. |
| | Spring | Greenwich and West | 26 | 5 | " |
| | Washington | Canal and Spring | 6 | 3 | " |
| | Murray | Greenwich and Washington | 26 | 29 | |
| | Washington | Murray and Warren | ...... | ...... | |
| | Warren | West and Church | 43 | 36 | |
| | Washington | Barclay and Vesey | ...... | ...... | |
| | Barclay | Washington and Greenwich | 31 | 36 | |
| | Greenwich | Barclay and Robinson | | | |
| | Catharine | Henry and East Broadway | 19 | 8 | |
| | Chrystie | Canal and Grand | 16 | 7 | |
| | South | Catharine and Market | 50 | 18 | |
| | Sixth avenue | Thirteenth and Seventeenth | 63 | 3 | |
| | Eighth | Fifth and Sixth avenues | 4 | 1 | |
| | Broadway | Thirty-seventh and Forty-first | 37 | 13 | |
| Nov. 2 to 14 | Ninth avenue | Sixteenth and Twenty-seventh | 115 | 9 | General repairing. |
| | Nineteenth | Ninth and Tenth avenues | 9 | 3 | " |
| | Twenty-sixth | do. | 21 | 7 | " |
| | Broadway | Leonard and Murray | 32 | ...... | Repairing Russ pavement. |
| | Greenwich | Murray and Robinson | 15 | 8 | |
| | Vesey | Washington and Greenwich | 15 | 8 | |
| | Warren | Broadway and College place | 45 | 21 | |
| | Washington | Barclay and Vesey | ...... | ...... | |
| | Robinson | West and Washington | 15 | 10 | |
| | Vesey | do. | | | |

| | | | | | |
|---|---|---|---|---|---|
| Nov. 2 to 14 | Washington | Barclay and Murray | 29 | 8 | |
| | Robinson | Washington and Greenwich | ...... | ...... | |
| | Barclay | Greenwich and Broadway | 28 | 14 | |
| | Greenwich | Cortlandt and Liberty | 4 | 61 | |
| | Do. | Jay and Harrison | 5 | 3 | General repairs. |
| Nov. 16 to 28 | Harrison | Greenwich and Hudson | 48 | 6 | " |
| | Greenwich | Harrison and North Moore | 23 | 1 | " |
| | Union square | ...................... | 27 | 4 | Backing bridge. |
| | Franklin | Greenwich and Hudson | 3 | ...... | General repairs. |
| | Broadway | Warren and Barclay | 21 | ...... | Repairing Russ pavement. |
| | University pl. | Fourth and Waverley place | 9 | 3 | Repairing cobble pavement. |
| | Greenwich | Liberty and Battery place | 55 | 84 | |
| Nov. 30 to Dec. 12. | Do. | North Moore and Hubert | 11 | 2 | General repairing. |
| | Do. | Beach and Desbrosses | 23 | 8 | " |
| | Beach | Greenwich and Hudson | 7 | ...... | " |
| | Hudson | Junction West Broadway | 44 | 29 | " |
| | Battery place. | West and Broadway | 18 | 6 | " |
| | Rect'r & Mor's | ...................... | 7 | 3 | " |
| | South | James and Rutgers | 46 | 40 | " |
| Dec. 14 to 26 | Junction | Hudson and West Broadway | 22 | 15 | " |
| | Do. | Perry and Bleecker | 2 | 2 | |
| | Perry | Bleecker and Greenwich av | 9 | 3 | Repairing. |
| | Frankfort | Opposite Rose | 3 | 2 | " |
| | Rose | Frankfort and Duane | 3 | 3 | " |
| | Leonard | Broadway and Hudson | 27 | 11 | " |
| | Chambers | Broadway and Church | 11 | 2 | " |
| | | Total | 10,905 | 4,276 | |

---

NOTE.—By reference to Schedule No. 12, it will be seen, that there has been expended in the purchase of paving stone, the sum of eighty-one dollars and twenty-five cents only; while, by the preceding statement, it is shown that 4,276 loads of stone have been used in making repairs to the different streets; it may, therefore, be proper to state, by way of explanation, that the greater part of the stones so used were taken from Chatham street, the Bowery, and Union square, preparatory to the laying of the Belgian pavement in those thoroughfares. The saving to the city, from this source, may be estimated at the rate of one dollar per load for the quantity thus obtained.

# SCHEDULE No. 20.

## CROSS-WALK RETURNS.

| DATE. | STREET. | CORNER OF | LOADS SAND. | LOADS STONE. |
|---|---|---|---|---|
| June 27 to J'ly 25 | Fifth avenue | Thirty-second | ...... | ...... |
| | Essex | Delancey | ...... | ...... |
| | Houston | Eldridge | ...... | ...... |
| | Stanton | Essex | ...... | ...... |
| | North Moore | Greenwich | ...... | ...... |
| | Broadway | Twenty-third | ...... | ...... |
| | Madison av | do. | ...... | ...... |
| | Houston | Ludlow | ...... | ...... |
| | Do. | Orchard | ...... | ...... |
| | Do. | Allen | ...... | ..... |
| | Do. | First avenue | ...... | ...... |
| | Cedar | West | ...... | ...... |
| July 27 to Aug. 8 | Delancey | Suffolk | ...... | ...... |
| | Rivington | do | ...... | ...... |
| | Houston | Chrystie | ...... | ...... |
| | Do. | Second avenue | 10 | ...... |
| | Do. | Forsyth | ...... | ...... |
| | Hester | Orchard | 10 | ...... |
| | Do. | Ludlow | ...... | ...... |
| | Stanton | Goerck | 10 | ...... |
| | East Broadw. | Rutgers | 10 | ...... |
| | Pearl | Chatham | ...... | ...... |
| | Roosevelt | do. | 8 | ...... |
| | Orange | do. | ...... | ...... |
| | Mulberry | do. | ...... | ...... |
| | Chatham | Orange | ...... | ...... |
| | Do. | Roosevelt | ...... | ...... |
| | Do. | Mulberry | ...... | ...... |
| | Roosevelt | do. | ...... | ...... |
| | Chatham | James | ...... | ...... |
| | Chambers | Chatham and Centre | 4 | 4 |
| | Broadway | Chambers and Reade | 8 | ...... |
| Aug. 10 to 22 | Broadway | Duane | 10 | ...... |
| | Rivington | Eldridge | 10 | 3 |
| | Hester | Forsyth and Bowery | 5 | 2 |
| | Rivington | Clinton | 5 | 4 |
| | Chatham | Centre | 5 | ...... |
| | Do. | Tryon row | 4 | ...... |

| DATE. | STREET. | CORNER OF | LOADS SAND. | LOADS STONE. |
|---|---|---|---|---|
| Aug. 10 to 22 | Chambers | Centre | 6 | 5 |
| | Centre | Tryon row | 5 | ...... |
| | Bowery | Spring | 8 | 5 |
| | Do. | Pell and Doyer | 5 | ...... |
| | Duane | Elm and Church | 6 | 4 |
| | Broadway | Duane | 3 | ...... |
| Aug. 24 to Sep. 5 | Broome | Forsyth | 40 | 15 |
| | Grand | Chrystie | 15 | 5 |
| | Bowery | Prince | 15 | 14 |
| | Do. | Rivington | 5 | 10 |
| | Do. | Pell | 4 | 3 |
| | Do. | Doyer | 6 | 5 |
| | Do. | Division | 10 | ...... |
| | Catharine | do. | 4 | ...... |
| Sept. 7 to 18 | Do. | Chatham | 4 | ...... |
| | Beach | West | 20 | ...... |
| | Tryon row | Centre | ...... | ...... |
| | Prince | Bowery and Broadway. | 10 | 8 |
| | West | Laight | 10 | 4 |
| | James | Chatham | 3 | ...... |
| | Prince | Bowery | 20 | ...... |
| | Marion | Spring | 10 | 10 |
| | Bowery | Delancey | 5 | ...... |
| Sept. 21 to Oct. 3 | Catharine | Division | 10 | 8 |
| | Chatham | Doyer | 4 | ...... |
| | Chrystie | Division | 4 | 5 |
| | Bowery | Broome | 16 | 5 |
| | Do. | Oliver | 5 | ...... |
| | Do. | and Chatham square | 10 | ...... |
| | Broome | Bowery | 4 | ...... |
| | Bowery | Stanton | 4 | ...... |
| | Do. | Chatham | 10 | ...... |
| | Do. | Stanton | 8 | ...... |
| | Houston | Elizabeth | 8 | 5 |
| | Spring | Marion | 8 | 10 |
| | Fourteenth | Broadway | 14 | ...... |
| | Prince | Elizabeth | 10 | 9 |
| Oct. 5 to 17 | Twenty-seco'd | Fifth and Sixth avenues | 5 | ...... |
| | Mott | Houston | 20 | 15 |
| | Do | Prince | 14 | 11 |
| | Hamilton | Catharine | 6 | 8 |
| | Water | do. | 10 | 10 |
| | Hamilton | do. | 5 | 4 |
| | Bleecker | Mott | 5 | 4 |
| | Fourteenth | University place | 38 | ...... |
| | Catharine | Henry | 5 | 4 |

## SCHEDULE No. 20—Continued.

| DATE. | STREET. | CORNER OF | LOADS SAND. | LOADS STONE. |
|---|---|---|---|---|
| Oct 19 to Dec. 12 | Bowery | Houston | 6 | 4 |
| | Oliver | East Broadway | 4 | ...... |
| | Mott | do. | 47 | ...... |
| | Bowery | Stanton | 25 | 4 |
| | University pl. | Fourteenth | 31 | 10 |
| | Do. | Union square | 65 | ...... |
| | 14th and 15th. | do. | 31 | ...... |
| | Catharine | East Broadway | 5 | 3 |
| | Do. | Oak | 9 | 5 |
| | Do. | Monroe | 16 | 9 |
| | Thirty-ninth | Third avenue | 5 | 3 |
| | Eighth | Sixth avenue | 12 | 9 |
| | Catharine | Madison | 3 | 2 |
| | Duane | Hudson | 20 | 10 |
| | Duane Park | | 100 | 75 |
| | Sixty-first | Third avenue | ...... | ...... |
| | Do. | Second avenue | ...... | ...... |
| | Thomas | Hudson and West B'd'y | 5 | 8 |
| | Broadway | Seventeenth & Eight'th | 10 | 7 |
| | Rivington | Bowery and Columbia. | 20 | 15 |
| | Whitehall | Battery pl. and Front. | 25 | ...... |
| | Cedar | Nassau and William | 6 | 4 |
| | Cherry | Pelham | 4 | 10 |
| | Astor place | Broadway and 4th av. | 15 | 15 |
| | East Broad'y. | Catharine | 10 | 8 |
| | Columbia | Grand and Stanton | 15 | 10 |
| Dec. 14 to 26 | East Broad'y. | and Catharine | 6 | 3 |
| | Whitehall | Broadway and Pearl | 10 | ...... |
| | Prince | Broadway | 3 | ...... |
| | Ann | William | 4 | 3 |
| | West Broad'y | Reade | 28 | 16 |
| | Do. | Duane | 2 | ...... |
| | Hudson | Barrow | 6 | 3 |
| | Gouverneur | E. Broadway & Water. | 18 | 20 |
| | Baxter | Chatham and Leonard. | 20 | 14 |
| | Leonard | Elm and Centre | 4 | 5 |
| | Hester | Baxter and Bowery | 10 | 10 |
| | Fulton | Water | 4 | ...... |
| | University pl. | Twelfth | 5 | 6 |
| | Broadway | | 2 | 1 |
| | Rivington | Tompkins | 6 | 25 |

## SCHEDULE No. 21.

*The following table exhibits the yearly revenue derived from Croton Water, as collected by the Department, from its introduction into the city, in 1842, with the annual increase or decrease thereof.*

| TIME. | RECEIPTS. | INCREASE. | DECREASE. |
|---|---|---|---|
| Oct. 5, 1842 to May 1, 1843. | $32,053 74 | ........... | — |
| May 1, 1843 " " 1, 1844. | 84,444 68 | 52,390 94 | — |
| " 1, 1844 " " 1, 1845. | 117,277 86 | 32,833 18 | — |
| " 1, 1845 " " 1, 1846. | 163,900 52 | 46,622 66 | — |
| " 1, 1846 " " 1, 1847. | 193,346 24 | 29,445 72 | — |
| " 1, 1847 " " 1, 1848. | 219,416 72 | 26,070 48 | — |
| " 1, 1848 " " 1, 1849. | 250,081 51 | 30,664 79 | — |
| " 1, 1849 " Dec 31, 1849. | 259,532 97 | 9,451 46* | — |
| Jan. 1, 1850 " " 31, 1850. | 458,951 87 | 199,418 90† | — |
| " 1, 1851 " " 31, 1851. | 458,789 78 | ........... | $162 09‡ |
| " 1, 1852 " " 31, 1852. | 533,965 16 | 75,175 38 | — |
| " 1, 1853 " " 31, 1853. | 579,956 30 | 45,991 14 | — |
| " 1, 1854 " " 31, 1854. | 608,966 15 | 29,009 85 | — |
| " 1, 1855 " " 31, 1855. | 674,736 42 | 65,770 27 | — |
| " 1, 1856 " " 31, 1856. | 662,949 57 | ........... | 11,786 85 |
| " 1, 1857 " " 31, 1857. | 697,370 51 | 34,420 94 | |
| Total........ | $5,995,740 00 | | |

---

* Eight months.

† Under the operation of the laws of 1849.

‡ A reduction in the rents, equal to about 10 per cent., was made this year.

## SCHEDULE No. 22.

The following table exhibits the yearly revenue derived from permits to connect premises with the public sewers, as collected by this department; also, the yearly expenditures for cleaning, repairing, and rebuilding the sewers and their appurtenances.

| TIME. | RECEIPTS. | EXPENDITURES. |
|---|---|---|
| Feb. 5, 1846 to Dec. 31, 1846.. | $4,852 50 | $4,404 17 |
| Jan. 1, 1847 to Dec. 31, 1847.. | 7,470 00 | 4,753 01 |
| “ 1848 to “ 1848.. | 5,585 00 | 4,673 05 |
| “ 1849 to “ 1849.. | 11,759 50 | 9,936 25 |
| “ 1850 to “ 1850.. | 18,977 00 | 8,118 97 |
| “ 1851 to “ 1851.. | 21,835 50 | 11,230 78 |
| “ 1852 to “ 1852.. | 28,132 50 | 12,554 66 |
| “ 1853 to “ 1853.. | 29,353 00 | 14,262 05 |
| “ 1854 to “ 1854.. | 26,247 00 | 12,402 51 |
| “ 1855 to “ 1855.. | 27,251 20 | 16,179 45 |
| “ 1856 to “ 1856.. | 24,122 00 | 20,765 94 |
| “ 1857 to “ 1857.. | 21,425 50 | 19,827 94 |
|  | $230,010 70 | $139,108 78 |

# APPENDIX

REFERRED TO IN THE BODY OF THE REPORT, PAGE 11.

---

# Contract and Specification

FOR

# NEW RESERVOIR AT YORKHILL.

**This Agreement,** made and concluded this day of in the year one thousand eight hundred and fifty-seven, by and between The Mayor, Aldermen and Commonalty of the City of New York, by the Croton Aqueduct Board of the first part, and

of

contractor of the second part:

WITNESSETH, That the said part of the second part, ha agreed, and by these presents do agree with the said parties of the first part, for the consideration hereinafter mentioned and contained, and under the penalty expressed in a bond, bearing even date with these presents, and hereunto annexed, to furnish at own proper cost and expense, all the necessary materials not found on the reservoir ground belonging to the Croton Aqueduct Department, within the outer slope stakes, and all labor, and to excavate for, and build a good, firm and substantial Reservoir, of the dimension, in the manner and under the conditions hereinafter specified, and ha further agreed, that the said Board shall be, and are hereby authorized to appoint, from time to time, such civil engineer and assistants and inspectors under him, as they may deem proper, to inspect the materials to be furnished, and the work to be done under this agreement; and to see that the same strictly correspond with the specifications hereinafter set forth.

To prevent all disputes and litigation, it is further agreed, by and between the parties to this contract, that said engineer, shall in all cases determine the amount or the quantity of the several kinds of work which are to be paid for under this contract; and he shall determine all questions in relation to lines, levels and dimensions of work; and he shall, in all cases, decide every question which may arise relative to the execution of this contract on the part of said contractors; and his estimate and decision shall be final and conclusive.

**And it is further agreed** by the parties to this agreement, that whenever the engineer aforesaid, shall be unable to act in consequence of absence or other cause, then the principal assistant employed under him, when required by the Croton Aqueduct Board, shall perform all the duties, and is vested with all the power herein given to said engineer.

## SPECIFICATIONS.

(1.) The Reservoir is to be built between Eighty-fifth and Ninety-seventh streets and the Fifth and Eighth avenues, in the city of New York, according to the plans on file in the office of the Croton Aqueduct Department, subject to such modifications as may be made by the engineer under the direction of the Croton Aqueduct Board.

(2.) All work shall, during its progress and on its completion, conform to the lines and levels, which may, from time to time, be given by the engineer and his assistants; and all slopes and faces on embankments and cuts, shall be dressed true and even, according to the lines and levels given as the work progresses.

(3.) The Reservoir will be formed by an exterior bank forming the outer sides of the basins; there will be a division bank dividing the Reservoir into two basins; all the banks will have the inner and outer slopes of one and a half base to one perpendicular, all the inner or water slopes will be covered with eight inches of broken stone, on which will be placed the stone pavement one and a half feet thick; the outer slopes will be covered with soil one foot thick. The banks will, when finished, be fifteen feet wide on top, exclusive of the soil on the outer slope. The top of the outer bank will be four feet above water line; which is on the level of the top of the intrados of the covering arch of the Aqueduct in the gate-house (in Seventh avenue,) of the Receiving Reservoir; the top of the division bank will be three feet below the water line. In the centre of all the banks, a puddle bank will be built, extending from the rock to the paving in the division bank, and to within two feet of the top of the outer bank. It will be six feet two inches wide at top in the division bank, and four feet wide at top in the exterior bank, and sixteen feet wide at a plane thirty-eight feet below the top of the exterior Reservoir bank. In the middle of the division bank there will be built a brick wall, laid in cement mortar, four feet high, and twenty inches or two and one half bricks wide; the top of the wall to be connected with the bottom of the stone pavement. Eight inches in thickness of concrete is to be laid on the top of the bank on each side of, and connected with the wall; on this the pavement, eighteen inches thick will be laid in cement. The slope wall on each side of the division bank will be laid in cement, so far down as directed in these specifications.

(4.) The work to be done is:—To clear the ground to be occupied by the Reservoir and its appurtenances of all soil and other matter not suitable for the embankments; to remove all stones and loose rocks from the area to be occupied by the embankments; to excavate the interior of the Reservoir or Basins, and with the proper earth to form the embankments as far as suitable for that purpose, and with the rock to form the paving or stone lining of the Reservoir, slopes and other masonry on the embankments, as specified, and to place the soil not required in embankments and surplus rock, in spoil banks; and to excavate drainage ditches and puddle ditches, and areas for the foundations of the gate-houses, aqueduct, pipe chambers, waste wells, sewers and pipes, and all accessories; and to furnish so much clay, gravel and earth for the construction of the embankments and puddle banks, as may not be obtained from excavations within the Reservoir ground, as it may be laid out by the engineer, and to cover the outer slope with the soil taken from the surface, and all other work called for in these specifications, or by any changes in the plan as provided for in the contract.

(5.) All soil and all vegetable matter and mud, to such depths as the engineer may at any points determine, is to be removed from all the space within the lines of the outer slopes of the Reservoir banks, and placed in spoil banks, free from stones or rocks, outside of the outer slopes, or on the outer slopes, at such points and in such manner as the engineer may direct, not requiring an extreme haul of more than fifteen hundred feet. All boulders or other stones, or loose rocks of more than two inches in any dimensions, and all other materials from the excavations, which the engineer may not deem suitable for embankment or puddle, shall be removed from the ground to be occupied by the embankments, and disposed of as hereafter directed. All stumps and roots shall be grubbed out of the ground to be occupied by the embankments, and all wood, roots and rubbish shall be removed from the ground, or burnt before the puddle or embankments are commenced.

(6.) Drainage ditches are to be formed in each Basin, two feet wide at bottom, with slopes of two base to one vertical, from the drainage sewer near Eighty-sixth street, to such extent as the engineer may direct.

(7.) Puddle ditches are to be excavated to the rock under the centre of all the embankments, where the rock is not lower than forty-six feet below the top of the exterior Reservoir bank; and in any loose, broken, soft or porous rock, the ditches will be excavated to such depth as the engineer may direct.

Puddle ditches will be laid out with a slope of one base to two vertical, and the contractor will, in all cases, be allowed that width in measurements; the width at bottom (which can only be ascertained when the rock is reached,) will be that required for the puddle.

If planks are required to support the sides of the puddle ditches, the contractor will furnish them at his own expense; when plank are thus used, they will be placed one foot outside of the puddle at bottom, on each side; and whenever the sides of the puddle ditches cave or crack, the broken earth is to be removed, and the earth refilled and packed as in the embankments. No measurement beyond that above specified, will be allowed, for any excavation or filling on the puddle ditches.

(8.) When the rock is more than forty-six feet below the top of the exterior Reservoir bank, and where else the engineer may deem it necessary, two rows of sheet piling are to be driven to the rock sixteen feet apart, and the material between them excavated to the depth of forty feet below the top of the exterior Reservoir bank, and as much further as to remove all soil, muck, mud or vegetable matter. Should the engineer deem it advisable, the sheet piling will be driven in double rows, in which case, each row will be estimated and paid for per square foot, at the price in the contract.

(9.) Sheet piling will be formed of spruce or pine plank, six inches thick, tongued and grooved, the tongue and groove to be 1½ × 1 inch, according to the plan; the plank to be not less than ten inches in width, and each plank to extend from the top of the piling to the rock. The planks to be driven with the ram, so as not to be cracked or split. The lumber to be sound and free from shakes. The top of the piling to be cut at the level of thirty-nine feet below the top of the exterior Reservoir bank.

(10.) The earth, within the working lines of the interior slopes of the basins, will be excavated to the depth of forty feet below the top of the exterior Reservoir banks, and as much lower as may be required by the engineer, to obtain materials for the embankments or for the puddling. The surface of the bottom of both basins to be worked to the same depth, and to such slopes as the engineer may direct. The exact depth cannot be determined until the surface of the rock is uncovered. Whenever it may be necessary to go below the bottom of the Reservoir, as it shall be established by the engineer, to obtain materials for embankment or for puddle, the space so excavated shall be filled up with such waste materials as the engineer may direct.

(11.) The material, whatever may be its depth, not less than six inches, which the engineer may deem suitable for puddling, will be excavated separately from other earth and appropriated to that purpose in the manner specified.

(12.) Rock is to be excavated to the depth of thirty-six feet below the top of the exterior Reservoir bank; the sides of the excavation to conform to the inner slopes of the Reservoir banks, care being taken not to shake or crack the solid rock, beyond the working lines, on or near the sides of the Reservoir. Whenever the rock is broken by blasting, beyond the slopes of the Reservoir banks, so as, in the opinion of the engineer, to be likely to cause leakage, the contractor will be charged with whatever expense the engineer may cause to be incurred as necessary to prevent such anticipated leakage. When any fissures, seams, or soft rock are found within the basin of the reservoir, or under the banks thereof, the rock is to be excavated to such extent as the engineer may direct, and the space filled with concrete, puddle, earth or sand as may be required by the engineer. Where the paving is to rest on rock, the rock shall be so prepared as to make a bed on which the paving and lining will rest, this will be done by excavating a face on the rock at right angles to the line of slope. All rocks, stones and coarse gravel which may not be required for the paving and lining of the Reservoir, and for the masonry to be built thereon, nor for the embankments, will be deposited in such manner, within the space described in specification, 1, as the engineer may direct. On the bottom of the basins, where the excavation in rock may be carried by the blasting below the working line, the spaces will be compactly filled with spauls or broken stone to the working line.

(13.) Excavations for the foundations of the gate-houses, pipe vaults, laying pipes and the aqueduct, within the outer slopes, to bring water to the Reservoir, and all accessory work, are to be carried to such depth and to such lines and at such times as the engineer may direct, either in earth or rock.

(14.) Should any excavation be required lower than the bottom of the drainage sewer, near Eighty-sixth street, the Croton Aqueduct Department will furnish drainage for such excavation, provided however, that if the contractor shall not keep such force on the excavation, as the engineer may require, then the contractor shall be charged with such part of the cost of such drainage as may be caused by such deficiency of force.

(15.) Puddling or puddle banks are to be formed in the puddle ditches and within all the Reservoir banks, to within two feet of the top of the outer Reservoir banks, and to the concrete on the top of the middle bank. At and below thirty-eight feet below the top of the exterior Reservoir bank, the puddling will be sixteen feet wide; above that height, the sides will approach each other with slopes of two inches base to one foot vertical, on each side. The puddle will be formed of clay, gravel, sand or earth, or such admixture of these materials, or of any of them, as the engineer may, from time to time, direct. The puddle to be laid in layers of not more than six inches, and well mixed with such quantity of water as the engineer may direct, and worked with spades by cutting through vertically in two courses at right angles with each other; the courses to be one inch apart, and each spading to extend two inches into the lower course or bed; or it will be packed and worked with such tools and such quantities of water as the engineer may deem necessary for the perfect formation of the puddle; each layer must be well worked into and incorporated with the layer on which it rests, the object being to obtain an uniformly compact mass, impervious to water. Boards will be used when the engineer may deem them necessary to support or guide the sides of the puddle; such boards as well as all other tools and materials, excepting as herein specified, will be furnished by the contractor at his own cost. During the working of the puddle, the ditches are to be kept free from any water that is not required for its formation. Whenever the work is suspended the puddle must be covered with boards or earth to prevent cracking, which will result from too rapid drying, and whenever cracks do occur in the puddle, those parts must be removed and reworked; the spaces on each side of the puddle in the ditches will be packed with earth, well rammed, as the puddle advances. When temporary sheet piling is used to support the banks of the puddle ditches, the planks must be withdrawn as the puddle rises, and the spaces between the natural earth and the puddle, filled with earth and well rammed. The space between the permanent pile-planking will be filled with puddle to the top of the pile-planking. The puddling will extend to all the masonry and pipes, and along and around it and them, to such extent as the engineer may direct. No material to be used for puddling without examination and approval of the engineer.

(16.) The embankment will be fifteen feet wide on top, exclusive of the dressing of soil on the outer bank, with slopes of 1½ base to 1 vertical. All the earth to be used in filling the puddle ditches, and in forming the embankments, must be free from all stones more than two inches in any dimensions. The different kinds or qualities of earth will be distributed to such parts of the embankment as the engineer may direct. The embankments will be formed in layers of not more than six inches, well packed by carting and rolling, and in such places as the rollers cannot be effectually used, by ramming, to such extent as the engineer may direct. The form and weight of the rollers and rammers to be determined by the engineer, from time to time, as the work progresses. The embankments will be worked to their full width as they rise in height, and not more than two feet in advance of the puddle; the puddle being always kept below the embankments. During the construction of the embankments, no sudden breaks will be allowed, nor will any slopes be allowed of more than five base to one vertical, on the surface which is being worked, excepting the slope in the puddle-trench.

Against the pipes and masonry, the puddle and embankments must be packed with rammers, to such extent as the engineer may direct. After the outer banks are formed the outer slopes will be covered with one foot in depth of soil, (measured at right angles to the slope) compacted by ramming.

When there is any deficiency in the embankments on the slopes, such deficiency must be made up with earth, or with soil, well rammed on the outer slopes, and with well rammed earth or broken stones on the inner slopes, at the discretion of the engineer; so that the slopes, when finished, shall be up to the working lines and plans. Any settlement of the embankments, or any washing or wastage of the banks, or other work, during the progress of the work, and to its final completion and final acceptance by the engineer, shall be made good by the contractor, by bringing the work to the proper lines and levels, as directed by the engineer.

The object is to make the embankment as compact and impervious to water as the nature of the material will admit of, and all work on the puddle and embankments must be done in a thorough workmanlike manner, with a view to accomplish this object.

(17.) Should the excavations within the outer slopes of the exterior Reservoir banks not furnish sufficient material of a suitable quality for puddling and embankments, in the opinion of the engineer, then the contractor will be required to furnish enough material, to supply the deficiency, and of such quality as may be approved by the engineer.

(18.) In the centre of the middle or division bank, there will be a brick wall, laid in cement, twenty inches, or two and a half bricks wide, and four feet high, resting on the puddle, and the puddle extending on each side to within eight inches of the top, according to the plan. The top of the wall will extend to the pavement. The top of the middle bank will be covered with eight inches of concrete, on which the pavement, eighteen inches thick, will be laid in cement mortar. And the pavement for ten feet in width, from the top on both slopes, as shown on the plan, will also be laid in cement mortar.

(19.) The interior slopes of all the banks will be covered with eight inches in thickness of stone broken to pass through a two inch ring. On this will be laid the paving, eighteen inches in thickness, of a single course of stones, set on the edge, at right angles with the slope, laid dry and well wedged with pinners. The stones to be laid in such manner as may be directed by the engineer; the base of the paving to extend to the rock, or to such depth as the engineer may direct; the stones to be sound and of proper shape, to make neat and compact work.

(20.) Concrete will be formed of clean broken stone, which will pass through a two inch ring, mixed with cement mortar.

(21.) The mortar for the concrete and for brick work is to be composed of two parts of sand to one of cement. The proportions of the mortar and stone in the concrete to depend on the capacity of the stone to receive the mortar, which shall be determined by the engineer. The mortar for stone work to be composed of three parts of sand and one of cement. The cement to be of fresh burnt Rosendale or Newark cement, and the sand to be sharp, clean and free from dirt or loam or mica. Concrete will be covered immediately after being laid to prevent cracking.

(22.) Bricks will be of the usual size used for sewers in the Croton Aqueduct Department. They will be of the best quality of sound hard bricks, burnt hard entirely through; no broken bricks or bats will be used but to break joints. All brick to be culled as they are brought to the ground, and to be subject to the inspection, and if not approved of, to the rejection of the engineer; and the contractor will, at any time, when requested, place at the disposal of the engineer so many men as may be required to overhaul and examine the bricks, and any rejected bricks are to be immediately removed from the ground by the contractor. Such men to be at the expense of the contractor.

(23.) Each barrel of cement after it is delivered on the work, shall be inspected, and it shall not be used until approved of by the engineer.

(24.) All brick shall be wet thoroughly by immersion, unless otherwise directed by the engineer. Mortar will not be reworked after having set, and no mortar will in any case be used which has been made more than two hours.

Every brick is required to have full mortar joints under bottoms, sides and ends, which for each brick, is to be formed by one operation, and in no case is it to be made by working in the cement after the brick is laid; not more than two courses of brick to be laid without lining.

(25.) The contractor will at all times when required by the engineer, place at the disposal of the Croton Aqueduct Board, any stone or rock which is found on the Reservoir ground, or which has been excavated, and which may be wanted for the construction of any masonry which is to be built in connection with the Reservoir, and deposit the same at such places and in such manner and form, within the space specified in specification 1, as the engineer may direct.

(26.) All masonry shall be covered in winter, by and at the expense of the contractor, to prevent injury from water and from freezing, to the satisfaction of the engineer.

(27.) During the construction of the masonry of the gate-houses, pipe vaults, conduit, the laying of pipes, and other necessary work, the Croton Aqueduct Board reserves the control of so much ground as the engineer may deem necessary for the proper accommodation in the construction of such works, and of the persons employed on them.

(28.) All work in masonry and puddle banks is to cease positively on the 1st of November in each year, and not to be resumed until the 1st of April ensuing, except by written permission of the engineer. Neither masonry or puddle banks will at any time be built during freezing weather.

(29.) Embankments will not be constructed from the first of December to the 1st of April next ensuing in any season, nor at any time during freezing weather.

(30.) The puddle banks will be covered in the winter with earth or otherwise, to the approval of the engineer to prevent freezing.

**(31.) Quantities estimated for the construction of the work, on which the comparisons of bids will be made.**

| | | |
|---|---|---|
| *E. | 792,519 | cubic yards of excavation, composed as follows, viz: 63,304 cubic yards of soil and other materials not suitable for the construction of embankment, to be placed in spoil banks, within the space mentioned in specification (1;) (of which 17,362 cubic yards will be placed on the outer slopes of the banks,) and 25,000 cubic yards of excavation from the puddle ditches to be placed in embankment or spoil bank ; 704,215 cubic yards of excavation, for puddle and embankments. |
| F. | 284,894 | cubic yards of rock excavation. |
| G. | 78,988 | cubic yards of puddle in the ditches and embankment. |
| H. | 642,589 | cubic yards of embankment, exclusive of the puddle bank. |
| I. | 20,938 | cubic yards of broken stone lining of inner slopes. |
| K. | 47,111 | cubic yards of stone paving or slope wall. |
| K$^2$ | 2,009 | cubic yards of paving laid in cement. |
| O. | 555 | cubic yards of brick wall, laid in cement. |
| P. | 833 | cubic yards of concrete on the middle bank. |
| Q. | 54,000 | square feet (superficial measure) of sheet piling. |

In comparing the proposals, the time bid will be estimated at one hundred and fifty dollars per day.

Other quantities, dependent on developments in the progress of the work, are not estimated. The foregoing are the quantities which have been estimated, approximately, for the construction of the work; they form however no part of the contract, and persons bidding are cautioned, that the Croton Aqueduct Board do not hold themselves responsible that any of them shall strictly obtain in the construction of the work, and the contractors are required to examine the plans and the ground, and to judge for themselves, as well of the quantity, as the distance of haul, and other circumstances affecting the cost of the work, and to make their bids for each item, independent of others so far as relative quantities are concerned.

---

* These letters refer the quantities to the prices to be bid for the work under the same letters in the proposals. Letters L, M and N have no quantities ascertained.

(32.) In order to enable the contractor to prosecute the work advantageously, the said engineer shall make an estimate, from time to time, not oftener than once a month, as the work progresses, both of work done and materials delivered on the ground to be occupied by said Reservoir. The estimate for unfinished work shall not be required to be made by strict measurement, but by measuring and estimating, to obtain only an approximate result of the work done and its value under the contract, as compared with the whole contract; and it shall not be required of said engineer to measure at all for work that is in an irregular shape, but he may estimate the quantity of such on his judgment of the amount of the same. Between the months of November and May, the estimates shall not be made oftener than once in two months, and at no time for a sum less than $500; and it is expressly understood, that estimates shall be made only when the work is prosecuted, agreeably to the provisions of this contract, and with such progress as may be satisfactory to the engineer.

(33.) The contractors are required to preserve all stakes, street bounds, and bench marks in their proper positions, until authorized to remove them by the engineer. Any expense incurred in replacing any stakes, street bounds, or bench marks, which the contractor, or any person working under him, may have failed to preserve, will be charged to the contractor and deducted from the amount to be paid him for doing the work under this contract.

(34.) The contractor will, during the construction of the work, prevent any materials being taken from the Reservoir ground without the direction of the Croton Aqueduct Board.

(35.) No shanties or other buildings shall be erected, on the Reservoir ground in charge of the Croton Aqueduct Board, without authority in writing from said Board.

(36.) Whenever the contractors are not present on any part of the work where it may be necessary to give directions, orders will be given by the engineer, his assistants and inspectors, to and be received and obeyed by the superintendents and overseers who may have immediate charge of the men employed on the particular work, in relation to which the orders may be given.

(37.) The Contractor shall, when required to do so by the engineer, remove from the work, any overseer, superintendent, laborer or other person employed on the work, who shall refuse or neglect to obey the directions of the engineer, or his assistants, or the inspectors under him, in any thing relating to the work, or who shall perform his work in any manner contrary to the specifications and directions of the engineer, or who shall be deemed by the engineer to be incompetent or unfaithful, or who shall commit any trespass on the Reservoirs or other property in the vicinity of the work.

(38.) All work to be done under these specifications shall be to the satisfaction of the engineer, and all materials and workmanship shall be subject to the inspection and rejection of the engineer, or of the agents authorized to act under him.

(39.) Inspectors will be placed on the work to observe and direct the manner of construction, and no new party will be put at work on the embankments, masonry, or puddle, or preparing the ground, or materials, without three days previous notice to the engineer, to provide an inspector for such party.

(40.) No work is to be considered as accepted which may be defective in its construction, or deficient in any of the requirements of these specifications, in consequence of any negligence of any inspector or subordinate engineer to point out such defect or deficiency during the construction ; and the contractor will be required to correct any imperfect work whenever discovered before the final acceptance of the work.

(41.) Any doubt as to the meaning of these specifications, or any obscurity as to the wording of them will be explained by the engineer ; and all directions and explanations required, allude to, or necessary to, complete any of the provisions of these specifications, and give them due effect will be given by the engineer.

(42.) Whenever the word contractor is used in these specifications or in this contract, it is to be taken and used for the party who has entered into the contract to perform the work to be done under these specifications, or the legal representative of such party.

(43.) Whenever the word engineer is used in these specifications, or in this contract, it refers to and designates the engineer who may, by the Croton Aqueduct Board, be appointed for the time being, to have charge of the construction of the Reservoir herein specified.

And it is further mutually agreed, by and between the parties to this contract, that the quantities to be paid for shall be measured by the engineer and his assistants, according to the plans and the working lines which may be given, when the work comes up to such line, and no allowance will be made for any excess above the quantity required by such plans or lines, on any portion of the work.

And it is further agreed, that the work shall be commenced and carried on at such parts, and in such order of precedence, and at such times and seasons as may, from time to time, be directed by the engineer, and all work shall be, in every respect, executed in a thorough and workmanlike manner.

And said part of the second part further agrees, that said Croton Aqueduct Board, or the engineer, may make alterations in plan, form or dimension of said work, either before or after the commencement of the construction, If such alterations diminish the quantity of work to be done, they shall not constitute a claim for damages, or for anticipated profits on the work that may be so dispensed with. If they increase the amount of work, such increase shall be paid for only according to the quantity actually done and at the price established for similar work under this contract; and the contract will be regarded as completely executed and fulfilled, when the work required by the altered plans is done and paid for, as herein provided.

And it is further agreed, that if the work shall be increased by the enlargement of any part of the same, or by any contingent work which the engineer may deem necessary to facilitate the execution, or render the work in any particular conformable to local circumstances, or which may be deemed by the engineer necessary for perfecting the work, beyond what is provided for in this contract and specifications, such increase shall be paid for at the same rate as similar work is herein contracted to be paid for; and if such work is not similar to work herein contracted for, it shall be paid for as an extra item, at a price to be agreed upon previously to the commencement of such extra work.

And it is further agreed, that no public or private road or building, or other improvement on the ground appropriated for said Reservoir, will be obstructed, injured or removed by the contractor, until special directions shall be given by the engineer to enter upon the same.

And said part of the second part further agree that will not, of or by agent or agents, give or sell any ardent spirits or intoxicating drinks to workmen, or any other person on or near said work, or allow any to be brought on the work by laborers, or any other persons, and will do all in power to discountenance and effectually prevent its use, on or in the vicinity of the work, by any person or persons whatever.

And it is further agreed, that if any material brought on the ground for the use of the work, or selected from the excavations for the same, shall be condemned by the engineer as unsuitable for the work, the contractor shall forthwith remove said materials from the work.

And it is further agreed, that if any work shall be condemned by the engineer as defective, or improperly done, such defective or improper work shall be taken down and rebuilt, or the defects otherwise remedied as the engineer may direct; and if said contractors decline, refuse or neglect to remove such condemned materials, or to rebuild such condemned work, or otherwise correct the defects as the engineer may direct, then the engineer may employ, in behalf of the Croton Aqueduct Board, men, animals, tools and implements to do the same, and the expense thereof shall be deducted from any money which may be otherwise due said contractor.

And the said part of the second part hereby covenant and agree that will give personal attention constantly to the faithful prosecution of the said work. And that will not sub-let the aforesaid work but will keep the same under own control; that will not assign, by power of attorney or otherwise, any of the moneys payable under this agreement, unless by and with the previous consent of the Croton Aqueduct Board, to be signified by indorsement on this agreement; and that will punctually pay the workmen who shall be employed on the aforesaid work in current cash funds and not in what is denominated store pay.

The said part of the second part further agree that if the work to be done under this agreement shall be abandoned. or if this contract shall be assigned by the party of the second part otherwise than is herein specified, or if at any time the engineer appointed by Croton Aqueduct Board to have charge of the construction of said work, shall be of opinion and shall so certify in writing to said Board, that the said work, or any part thereof, is unnecessarily or unreasonably delayed, or that the said contractor is willfully violating any of the conditions or covenants of this contract, or executing said contract in bad faith, they shall have the power to notify the aforesaid contractor to discontinue all work, or any part thereof, under this contract; and thereupon the said contractor shall cease to continue said work, or such part thereof as said Board may designate, and the said Board shall thereupon have the power to place such and so many persons, and obtain, by purchase or hire, such animals, carts, wagons, implements and tools, as the engineer may deem necessary, by contract or otherwise, as said Board may deem advisable, to work at and be used to complete the work herein described, or such part thereof, as the engineer may deem necessary, and to use such materials as they may find upon the line of said work, and to procure other materials for the completion of the same, and to charge the expense of said labor and materials, animals, carts, wagons, implements and tools to the aforesaid contractor, and the expense so charged shall be deducted and paid by the parties of the first part out of such moneys as may be either due or may at any time thereafter become due to the said contractor, under and by virtue of this agreement or any part thereof, and in case such expense is less than the sum which would have been payable under this contract, if the same had been completed by said contractor, then the said part of the second part shall be entitled to receive the difference; and in case such expense shall exceed the last said sum then the said part of the second part shall pay the amount of such excess to the parties of the first part on notice from the said Board of the excess so due.

And the said part of the second part hereby agree to receive the following prices as full compensation for furnishing all the materials which may not be found on the ground, and for labor in building, moving materials, and constructing, and in all respects completing the aforesaid work according to the plan and specifications and the requirements of the engineer under them, to wit:

(E.) For all excavation, whether hardpan, quicksand, stones, boulders, or otherwise, excepting solid rock which requires blasting, and excepting boulders more than half a cubic yard in capacity, and for disposing the materials according to the specifications in spoil bank, or in refilling excavations made to obtain materials, or embankments, or puddle bank, or puddle, to be measured in excavation,

cents per cubic yard.

(F.) For all excavations of solid rock which requires blasting and of boulders of a capacity of more than a half a cubic yard, and disposing the materials according to the specifications, to be measured in excavation,

cents per cubic yard.

(G.) For puddle bank, and all puddling required, including filling seams in the rock, when required, in addition to the price paid for excavation of the materials under item E, or furnishing materials under item M, to be measured in embankment,

cents per cubic yard.

(H.) For embankments, including the soil one foot in depth on the outer slopes and exclusive of all puddle and all masonry and broken stone on the slopes, in addition to the price paid for excavation in item E, or for furnishing materials in item N, when the engineer may direct, materials to be furnished from outside the Reservoir ground, to be measured in embankment,

cents per cubic yard.

(I.) For the lining of broken stone on the inner slopes of the embankments and placing the same as directed, and for all labor connected therewith to be measured in embankment,

cents per cubic yard.

(K.) For paving or constructing slope wall, the stone to be taken from the rock excavated after supplying the Croton Aqueduct Department with whatever they may require according to the specification, and for labor in constructing the same, to be measured in the wall,

cents per cubic yard.

(L.) For stone to be furnished for the paving, in case the stone for the excavation should not be deemed suitable for paving, by the engineer, in addition to the price above stated in item K, to be measured in the wall,

cents per cubic yard.

(M.) For all clay, earth, sand and gravel to be furnished for puddle, should the engineer deem the material from the excavations not suitable for that purpose, or should there be a deficiency in the quantity directed to be obtained, within the outer slopes of the exterior Reservoir bank, by the engineer, in addition to the price paid for puddle in item G, to be measured in embankment,

cents per cubic yard.

(N.) For earth to be furnished for embankment, should the engineer direct any to be obtained beyond or outside of the Reservoir ground, in addition to the price paid for embankment in item H, to be measured in embankment,

cents per cubic yard.

(O.) For constructing the brick wall in the middle bank, including furnishing all labor and materials,

cents per cubic yard.

(P.) For concrete, for all purposes required in the specifications, including furnishing materials, (the stone may be taken from the rock excavations not otherwise wanted,) and for all labor connected therewith, to be measured in the bed where placed,

cents per cubic yard.

(Q.) For each square foot of sheet piling, constructed according to the specifications,

cents per square foot.

And the said part of the second part hereby further agree that will furnish the said Croton Aqueduct Board with satisfactory evidence, that all persons who have done work or furnished materials under this agreement, and who may have given written notice to the said Board before or within ten days after the final completion and acceptance of the whole work under this contract, that any balance for such work or materials is due and unpaid, have been fully paid or satisfactorily secured. And in case such evidence be not furnished as aforesaid, such amount as may be necessary to meet the claims of the persons aforesaid shall be retained from the moneys due the said part of the second part under this agreement, until the liabilities aforesaid shall be fully discharged, or such notice withdrawn.

And the said part of the second part hereby further agree that the said parties of the first part shall be and they are hereby authorized to deduct and retain out of the moneys which may be due or become due to the said part of the second part under this agreement the sum of one hundred and fifty dollars per day as liquidated damages for each and every day the aforesaid work may be uncompleted over and beyond the time hereinafter stipulated for its completion.

And the said part of the second part further agree that will indemnify and save harmless the parties of the first part from all claims, demands, suits or actions of every name and description, brought against them, for or on account of any injuries or damages received or sustained by any party or parties by or from the said part of the second part servants or agents in the construction of said work or by or in consequence of any negligence in guarding the same or by or on account of any act or omission of the said part of the second part or agents; and the said part of the second part hereby further agree that so much of the moneys due to under and by virtue of this agreement, as shall or may be considered necessary by the Croton Aqueduct Board, shall or may be retained by the said parties of the first part until such suits or claims for damages as aforesaid, shall have been settled and evidence to that effect furnished to the satisfaction of said Board.

And it is further agreed by said parties to this agreement, that payments shall be made on the estimate of the engineer, which are required by specification 32, of eighty (80) per cent. only, of the amount of said estimates; and when the total sum so retained from the whole amount estimated shall have become ($75,000) seventy-five thousand dollars then the full amount of the subsequent estimates, shall be paid, as they become due, without any deduction.

And it is further agreed, that whenever, in the opinion of the engineer, the part of the second part ha completely performed this contract on part, said engineer shall certify the same in writing to the parties to this agreement, together with his estimate, embracing both stipulated and extra work, as herein provided, on which the part of the second part to be paid.

And, it is further expressly agreed, that no money shall become due and payable under this contract, except on the certificate of said engineer, as herein provided.

And the said part of the second part further agree that shall not be entitled to demand or receive payment for any portion of the aforesaid work or materials, except in the manner set forth in this agreement, nor until each and every of the stipulation hereinbefore mentioned are complied with, and the engineer shall have given his certificate to that effect; whereupon the parties of the first part will, at the expiration of twenty days after such completion and the delivery of said certificate, pay, and they hereby bind themselves and their successors, to pay the said part of the second part in cash, the whole amount of money accruing to the said part of the second part under this contract, excepting such sum or sums as may be lawfully retained, under any of the provisions of this contract, hereinbefore set forth, provided that nothing herein contained be construed to affect the right hereby reserved, of the said board to reject the whole or any portion of the aforesaid work, should the said certificates be found or known to be inconsistent with the terms of this agreement, or otherwise improperly given.

And the said part of the second part further agree to commence the work herein contracted for, within days from the date hereof, and that all work to be done under this contract shall be fully completed and performed on part by the day of in the year eighteen hundred and

*In witness whereof*, the parties to these presents have hereunto set their hands and seals the day and year first above written.

For the Mayor, Aldermen and Commonalty of the city of New York.

SIGNED AND SEALED }
IN PRESENCE OF }

Know all Men by these Presents, *That We,*

of the city of New York, are held and firmly bound unto the Mayor, Aldermen and Commonalty of the said city, in the sum of two hundred thousand dollars, lawful money of the United States of America, to be paid to the said Mayor, Aldermen and Commonalty, or their certain attorney, successors or assigns; for which payment, well and truly to be made, we, and each of us, do bind ourselves, and each of our heirs, executors and administrators, jointly and severally, firmly by these presents. Sealed with our seals. Dated this day of one thousand eight hundred and fifty.

Whereas, the above bounden by instrument in writing, under hand and seal, bearing even date with these presents, contract with the said Mayor, Aldermen and Commonalty, to furnish all the materials and labor, excavate for, build, construct, and, in all respects complete, in the manner, on the conditions, and for the considerations in the annexed and preceding contract mentioned and contained, a good, firm, and substantial reservoir, according to the specifications contained in, or annexed to said contract, and the plans alluded or referred to in the same.

Now, therefore, the condition of the above obligation is such, that if the said shall well and truly, and in good, sufficient and workmanlike manner, perform the work mentioned in the aforesaid contract, and complete the same in accordance with the terms and provisions therein stipulated, and in each and every respect comply with the conditions therein contained, then this obligation to be void; or else to remain in full force and virtue.

Signed and sealed
in presence of

# PROPOSALS

## TO THE CROTON AQUEDUCT BOARD,

### FOR BUILDING THE NEW RECEIVING RESERVOIR ON YORKHILL, BETWEEN EIGHTY-FIFTH AND NINETY-SEVENTH STREETS AND FIFTH AND EIGHTH AVENUES.

Made by

Dated

1. of the No. street, do hereby declare that the only person interested in this estimate; and that no other person than herein named, has any interest in this estimate, or in the contract proposed to be taken.

2. further declare, that this estimate is made without any connection with any other person or persons making an estimate for the same work; and is, in all respects, fair, and without collusion or fraud.

3. further declare, that no member of the Common Council, head of department, chief of bureau, deputy thereof, or clerk therein or any other officer of the Corporation of the city of New York, is directly or indirectly interested therein, or in the supplies or works to which it relates, or in any portion of the profits thereof.

4. further declare, that the names of the persons affixed to the consent hereto annexed, were written by said persons respectively; and that said persons are householders, or freeholders of the city of New York.

5. have carefully examined the annexed specification and form of contract, and the ground on which the work is to be constructed, and the plans of the same, will contract to build the reservoir and the appurtenances, of the dimensions, in the manner and on the conditions required by the specifications annexed, upon the following terms, viz :

(E.) For all excavation, whether hardpan, quicksand, stones, boulders or otherwise, excepting solid rock, which requires blasting, and excepting boulders, more than half a cubic yard in capacity, and for disposing the materials according to the specifications in spoil bank, or in refilling excavations made to obtain materials, or embankment, or puddle bank, or puddle, to be measured in excavation, cents, per cubic yard.

(F.) For all excavations of solid rock, which require blasting, and of boulders of a capacity of more than half a cubic yard, and disposing the materials according to the specifications, to be measured in excavation, cents, per cubic yard.

(G.) For puddle bank, and all puddling required, including filling seams in the rock, when required, in addition to the price paid for excavation of the materials, under item E, or furnishing materials under item M, to be measured in embankment, cents per cubic yard.

(H.) For embankments, including the soil one foot in depth on the outer slopes, and exclusive of all puddle and all masonry and broken stone on the slopes, in addition to the price paid for excavation in item E, or for furnishing materials in item N, when the engineer may direct materials to be furnished from outside the reservoir ground, to be measured in embankment, cents per cubic yard.

(I.) For the lining of broken stone on the inner slopes of the embankments, and placing the same as directed; and for all labor connected therewith, to be measured in embankment, cents per cubic yard.

(K.) For paving or constructing slope wall, the stone to be taken from the rock excavated, after supplying the Croton Aqueduct Department with whatever they may require, according to the specification, and for labor in constructing the same, to be measured in the wall, cents per cubic yard.

($K^2$.) For the same laid in cement mortar, including furnishing all labor and materials, to be measured in the work, cents per cubic yard.

(L.) For stone to be furnished for the paving, in case the stone for the excavation should not be deemed suitable for paving by the engineer, in addition to the price above stated in item K, to be measured in the wall, cents per cubic yard.

(M.) For all clay, earth, sand and gravel to be furnished for puddle, should the engineer deem the material from the excavations not suitable for that purpose, or should there be a deficiency in the quantity directed to be obtained within the outer slopes of the exterior reservoir banks, by the engineer, in addition to the price paid for puddle, in item G, to be measured in embankment, cents, per cubic yard.

(N.) For earth to be furnished for embankment, should the engineer direct any to be obtained, beyond or outside the reservoir ground, in addition to the price paid for embankment in item H, to be measured in embankment, cents, per cubic yard.

(O.) For constructing the brick wall in the middle bank, including furnishing all labor and materials, cents, per cubic yard.

(P.) For concrete, for all purposes required in the specifications, including furnishing materials, (the stone may be taken from the rock excavations not otherwise wanted,) and for all labor connected therewith, to be measured in the bed where placed, cents per cubic yard.

(Q.) For each square foot of sheet piling, constructed according to the specifications, cents, per square foot.

will further contract to commence the said work, at such time as shall be designated by the Croton Aqueduct Board, and complete the same, within days, next thereafter, (Sundays and holidays to be excepted;) and to authorize the said board to deduct from the moneys which may become due to me, under the contract for the above work, the sum of one hundred and fifty dollars for each day the same may be unfinished, after the time above stipulated shall have expired.

Signed,

CITY AND COUNTY OF NEW YORK, ss:

being duly sworn, say, that the several matters stated in the annexed proposals, are, in all respects, true.

Sworn and subscribed to, this
day of A.D., 185
before me

*Commissioner of Deeds.*

In consideration of the premises, and of one dollar to us, and each of us, in hand paid, by the Mayor, Aldermen and Commonalty of the city of New York, the receipt whereof is hereby acknowledged,

We, the undersigned, consent and agree, that if the contract for which the preceding estimate is made, be awarded to the person or persons making the same, we will become bound as sureties, for its faithful performance; and if the said person or persons shall omit or refuse to execute such contract, if so awarded, we will pay, without proof of notice or demand, to the said Mayor, Aldermen and Commonalty, any difference between the sum to which such person or persons would have been entitled, upon the completion of such contract, and the sum which the Corporation may be obliged to pay to the person to whom the contract shall be awarded; the amount in each case to be calculated upon the estimated amount of the work by which the bids are tested.

In witness whereof, we have hereunto set our hands, this day of one thousand eight hundred and fifty-

CITY AND COUNTY OF NEW YORK, ss:

The above-named, being sworn, says, that he is a householder or freeholder in the city of New York, and is worth the sum of one hundred thousand dollars, over and above all his debts of every nature, being the amount of the security required for the completion of the contract above referred to; that he has offered himself as a security, in good faith, and with an intention to execute the bond required by section 506 of the ordinance organizing the departments of the municipal government of the city of New York, and prescribing their powers and duties.

Sworn and subscribed to, before me, this
day of A.D., 185

CITY AND COUNTY OF NEW YORK, ss:

The above-named, being sworn, says, that he is a householder or freeholder, in the city of New York, and is worth the sum of one hundred thousand dollars, over and above his debts of every nature, being the amount of the security required for the completion of the contract above referred to; that he has offered himself as a security, in good faith, and with an intention to execute the bond required by section 506 of the ordinance organizing the departments of the municipal government of the city of New York, and prescribing their powers and duties.

Sworn and subscribed to, before me, this
day of A.D., 185

## PROPOSALS FOR NEW GRAND RESERVOIR, OPENED AUGUST 26TH, 1857, BY THE CROTON AQUEDUCT BOARD, IN PRESENCE OF THE COMPTROLLER.

| NAMES. | E. | F. | G. | H. | I. | K. | K. | L. | M. | N. | O. | P. | Q. | | TOTAL Amounts. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cubic yards excavation, 792,519. | Cubic yards rock excav. .281,894. | Cubic yards puddle, 78,988. | Cubic yards embankment, 642,589. | Cubic yd's stone lining, 20,938. | Cubic yards stone paving, 47,111. | Cubic yards paving in cem. 2,008. | L, M, N, are contingent, and are not included in the calculation of the bids. | | | Cubic yards brick wall, 555. | Cubic yards concrete, 833. | Square feet sheet piling, 54,000. | Time, per day, at $1 50. | |
| | cts. | $ c. | $ c. | cts. | $ c. | $ c. | $ c. | $ c. | $ c. | $ c. | $ c. | $ c. | $ c. | | $ c. |
| *1 Dinsmore, Wood & Co. | 12 | 70 | 40 | 16 | 90 | 1 25 | 2 50 | 50 | 50 | 75 | 6 00 | 3 00 | 12 | 600 | 614,001 97 |
| 2 Fairchild, Colman, Walker & Brown | 21 | 95 | 20 | 1 | 1 10 | 1 25 | 4 00 | 3 00 | 1 00 | 50 | 10 00 | 5 00 | 25 | 400 | 632,473 33 |
| 3 Jno. P. & T. Cumming, Jr. | 22 | 97 | 30 | 10 | 95 | 1 35 | 3 50 | 1 50 | 1 25 | 1 00 | 6 84 | 2 98 | 15 | 575 | 729,807 65 |
| 4 Ten Brook, Stewart, Gardiner & Logan | 30 | 1 00 | 32 | 10 | 1 25 | 90 | 3 00 | 2 50 | 1 00 | 1 00 | 6 00 | 6 00 | 25 | 400 | 768,612 16 |
| *5 George Tate | ...... | ...... | ...... | ...... | ...... | ...... | ...... | .... | .... | .... | ...... | ...... | ...... | .... | 819,305 36 |
| *6 Baldwin & Coats | 18 | 1 03 | 40 | 22 | 1 50 | 1 50 | 4 00 | 6 00 | 1 00 | 75 | 10 00 | 5 00 | 30 | 620 | 843,781 40 |
| 7 Benj. M. Clark | 21 | 89 | 30 | 19 | 1 25 | 2 50 | 4 00 | 2 00 | 62 | 30 | 7 00 | 4 50 | 25 | 775 | 855,142 46 |
| *8 Niven, Mallory & Wright | 20 | 95 | 40 | 10 | 3 00 | 3 00 | 5 00 | 3 00 | 60 | 60 | 8 00 | 6 00 | 30 | 650 | 862,337 20 |
| 9 Beard, Collins & Boyle | 26 | 1 00 | 24 | 13 | 2 00 | 2 00 | 3 75 | 2 00 | 65 | 60 | 8 00 | 4 25 | 50 | 700 | 877,054 63 |
| *10 George Law | 20 | 85 | 70 | 30 | 1 50 | 1 50 | 5 00 | 2 00 | 85 | 30 | 7 00 | 6 00 | 70 | 575 | 893,783 59 |
| *11 Secor & Emmett | 25 | 1 00 | 50 | 15 | 2 00 | 2 00 | 3 00 | 2 00 | 1 25 | 100 | 10 00 | 6 00 | 50 | 700 | 903,579 10 |
| *12 Farwell, Farwell, Case & Esterbrook | 21 | 1 00 | 50 | 22 | 1 58 | 2 50 | 5 75 | 3 25 | 2 50 | 1 30 | 7 25 | 6 75 | 30 | 900 | 925,444 36 |
| 13 Brown & Baker | 35 | 1 10 | 30 | 12 | 1 50 | 1 50 | 3 00 | 4 00 | 1 25 | 1 00 | 7 00 | 6 00 | 50 | 900 | 970,555 63 |
| *14 Learned & Baldwin | 25 | 95 | 50 | 35 | 2 00 | 1 50 | 8 00 | 3 00 | 1 00 | 1 25 | 10 00 | 8 00 | 35 | 800 | 1,012,907 70 |
| 15 Tracy, Pettigrew & Humes | 30 | 1 20 | 35 | 20 | 2 00 | 2 30 | 4 00 | 3 00 | 1 00 | 1 00 | 9 00 | 4 50 | 50 | 900 | 1,064,802 90 |
| *16 McNeil & Flanagan | 30 | 1 25 | 1 00 | 18 | 1 00 | 4 00 | 6 00 | 1 50 | 75 | 15 | 7 00 | 5 00 | 30 | 700 | 1,139,213 22 |
| *17 Stewart & Buck | 60 | 1 25 | 1 50 | 50 | 1 62 | 7 50 | 8 50 | 4 00 | 1 20 | 40 | 4 50 | 3 00 | 1 00 | 1200 | 1,914,730 46 |
| *18 J. R. Treat | ...... | ...... | ...... | ...... | ...... | ...... | ...... | .... | .... | .... | ...... | ...... | ...... | .... | 483,193 67 |
| *19 Samuel Strong & Co. | ...... | ...... | ...... | ...... | ...... | ...... | ...... | .... | .... | .... | ...... | ...... | ...... | .... | 575,344 75 |
| *20 Merrill & Co. | ...... | ...... | ...... | ...... | ...... | ...... | ...... | .... | .... | .... | ...... | ...... | ...... | .... | 1,489,028 84 |
| *21 E. & T. W. Histed & Co. | ...... | ...... | ...... | ...... | ...... | ...... | ...... | .... | .... | .... | ...... | ...... | ...... | .... | ............ |

*Bids numbered 1, 5, 6, 8, 10, 11, 12, 14, 16, 17, 18, 19, 20, and 21, were declared informal, see accompanying statement.

## PROPOSALS FOR NEW GRAND RESERVOIR, OPENED AUGUST 26TH, 1857.

| | NAMES OF BIDDERS. | NAMES OF SURETIES. | | REMARKS. |
|---|---|---|---|---|
| 1 | Samuel P. Dinsmore & John M. Wood. | Aaron H. Bean.... | Edward R. Olcott. | Informal—Wood & Dinsmore only interested, instead of Dinsmore, Wood & Co. Affidavits made by Samuel P. Dinsmore only. Sureties give no residence or place of business. |
| 2 | Egbert N. Fairchild, Isaac D. Coleman, Stephen C. Walker & Henry J. Brown, | Daniel A. Baldwin. | Jonathan W. Allen. | |
| 3 | John P. Cumming & Thos. Cumming, Jr. | Thomas Cumming. | John Pettigrew.... | |
| 4 | Derick W. Ten Brook, James Stewart, Cornelius Gardiner & George Logan. | Robert W. Lowber. | John B. Borst..... | |
| 5 | George Tate......................... | None............. | .................. | Informal, in all respects. |
| 6 | William Baldwin & H. H. Coats....... | Hamilton Littlefield | Stephen Clark..... | Informal, sureties give no residence or place of business. |
| 7 | Benjamin M. Clark................... | Jacob Sharp....... | James B. Taylor... | |
| 8 | T. M. Niven, James H. Mallory, & Wm. W. Wright......................... | Edward Learned... | Charles Gould..... | Informal—same as No. 6. |
| 9 | William H. Beard, Charles Collins & John Boyle ... ................... | William Beard.... | William Lynch.... | |
| 10 | George Law. ......................... | Oliver Charlock ... | James Murphy.... | Same as No. 6. |
| 11 | James F. Secor & Thomas A. Emmet.. | L. Secor.......... | .................. | One surety. |
| 12 | Samuel Farwell, Addison M. Farwell, Samuel F. Case & Thaddeus D. Esterbrook.............................. | James B. Taylor... | Jacob Sharp....... | Affidavit signed by A. M. Farwell only. |
| 13 | John L. Brown & Josiah W. Baker..... | J. S. T. Stranaban, | Morean Delano.... | |
| 14 | Thomas H. Learned & Jas. L. Baldwin. | Charles Gould..... | Edward Learned... | Sureties consent by one surety only. |
| 15 | Edward H. Tracy, John W. Pettigrew & James Humes..................... | Thomas Cumming. | John Pettigrew.... | |
| 16 | Edwin McNeill & John J. Flanagan.... | None............. | .................. | No sureties offer. |
| 17 | Daniel W. Stewart & Leander Buck.... | John N. Hayward. | William G. Chave. | Affidavits of sureties taken before a Commissioner of Deeds. |

Nos. 18, 19, 20 and 21 no sureties offered.

3 2044 103 127 734